UC RIVERSIDE



2025-2026 GENERAL CATALOG

GENERAL CATALOG | 2025-26



Charting Your Academic Path at UC Riverside & Beyond

The University of California, Riverside welcomes you to another year of academic exploration and discovery. As one of the nation's leading public research universities and a member of the Association of American Universities, UCR offers an education rooted in excellence, guided by purpose, and enriched by opportunity.

This catalog is your roadmap — a guide to the programs, people, and resources that will support you throughout your academic journey. Inside, you'll find a wide array of courses and experiences designed to prepare you not only for graduation, but for meaningful contributions in a rapidly changing world.

We understand that education is not an end in itself — it is preparation for life. Through your academic experiences, you will develop habits of critical thinking, ethical decision-making, and adaptability. Our programs are designed to help you explore your interests, build real-world skills, and chart a course toward careers that align with your goals and values.

At UCR, our faculty are advancing critical research, from protecting California's agriculture to exploring planetary science and public health. You will learn from and work alongside instructors and scholars whose discoveries are shaping fields and informing global conversations. Students are integral to this work, contributing through research, creative expression, and public engagement.

Whether you choose to pursue graduate study, public service, or professional careers in sectors such as the arts, health, science, technology, or business, UCR will equip you to make informed choices and contribute meaningfully to your community and society.

As a campus, we are proud of our long-standing commitment to student success and social mobility. We also value the diversity of background and thought, which strengthens our academic environment and prepares students to lead in a global society.

You are joining a university that values intellectual rigor, integrity, and public service. I encourage you to challenge yourself—to explore new ideas, collaborate across disciplines, and seek knowledge that contributes to the greater good.

I wish you a successful academic year and look forward to the impact you will make at UCR and beyond.

Sincerely,
S. Jack Hu, Ph.D.
Chancellor

About This Catalog

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PLEASE NOTE
Every effort has been made to ensure the accuracy of the information presented in the *University of California, Riverside General Catalog*. However, all courses, course descriptions, instructor designations, curricular degree requirements, and fees described herein are subject to change or elimination without notice. Students should consult the appropriate department, school, college, or graduate division for current information, as well as for any special rules or requirements imposed by the department, school, college, or graduate division.

Students can browse latest Schedule of Classes and the Course Catalog by logging into their **R'Web** account and selecting the **Registration** icon.

Faculty and staff can browse the latest Schedule of Classes by visiting registrar.ucr.edu.

The *2025–26 University of California, Riverside General Catalog* and prior issues are available at catalog.ucr.edu. Other campus websites providing similar information may not reflect current approved curricula or course information.



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DEGREES

Discipline	B.A.	B.S.	M.A.	M.S.	Ph.D.
Accounting, Auditing and Assurance			M.P.Ac.		
Actuarial Science		•			
Administrative Studies[1]	•	•			
African American Studies	•				
Anthropology	•	•	•	•	•
Anthropology/Law and Society	•				
Art (Studio)	•				
Art History	•		•		•
Art History/Administrative Studies	•				
Art History/Religious Studies	•				
Asian American Studies	•				
Asian Studies	•				
Astronomy				•	•
Biochemistry	•	•			
Biochemistry and Molecular Biology				•	•
Biological Sciences[2]		•			
Biology	•	•			
Biomedical Sciences		•[3]		•	•
Biomedical Sciences					M.D.-Ph.D.
Business Administration (see also Management)		•			
Biophysics				•	•
Black Study	•				
Business Analytics		•		•	
Business Economics	•				
Cell, Molecular, and Developmental Biology	•	•		•	•
Chemistry	•	•		•	•
Chicano Studies	•				
Classics	•		•[4]		•
Comparative Literature and Languages	•		•		•
Creative Writing	•				
Creative Writing and Writing for the Performing Arts			M.F.A.		
Critical Dance Studies			•[4]		•
Dance	•				
Data Science		•			
Earth and Planetary Sciences		•		•	
Economics	•		•[4]		•
Economics/Administrative Studies	•				
Economics/Law and Society	•				
Education[6]			•		•
Education			M.Ed.		
Education, Society, and Human Development	•				
Engineering					
Bioengineering[5]		•		•	•
Chemical[5]		•			
Chemical and Environmental[5]				•	•
Computer[5]		•		•	
Computer Science and Engineering[5]		•		•	•
Computer Science with Business Applications		•			
Data Science		•			
Data Science, Computational				•	
Electrical[5]		•		•	•
Engineering				•[7]	
Environmental[5]		•			
Materials Science and Engineering		•		•	•
Mechanical[5]		•		•	•
Robotics		•		•	
English	•		•[4]		•
Entomology[5]	•	•		•	•
Environmental Sciences	•	•			
Environmental Sciences[2] (Joint degree program with CSU Fresno)		•			
Environmental Sciences (Interdepartmental Graduate Program)				•	•
Environmental Studies	•				
Environmental Toxicology				•	•
Ethnic Studies	•		•		•
Evolution, Ecology, and Organismal Biology				•	•
Experimental Choreography			M.F.A.		
Finance			M.Fin.		
Gender and Sexuality Studies	•				
Genetics, Genomics, and Bioinformatics				•[4]	•



1 Administrative Studies, and Law and Society are only offered as a major combined with other programs.

2 New student registration in this program is not open at present.

3 Students who, in truly exceptional cases, matriculate into the Thomas Haider Program without a UCR baccalaureate degree are eligible to receive a B.S. degree in Biomedical Sciences upon satisfactory completion of the first year of the curriculum leading to the M.D. degree.

4 Applications are not accepted from students wishing to work toward the master's degree only.

5 A combined B.S.+M.S. program is offered in this discipline (designed to lead to a B.S. degree as well as an M.S. degree in five years).

6 See School of Education section for credential program information.

7 The Bourns College of Engineering offers an online Master of Science (M.S.) degree in Engineering. See Engineering section for more details.

8 New student registration in this program is not open at present. For further information, contact the Graduate Division.

9 Doctoral studies are available through the Ph.D. program in Comparative Literature.

DEGREES (CONTINUED)

Discipline	B.A.	B.S.	M.A.	M.S.	Ph.D.
Geological Sciences				•	•
Geology		•			
Geophysics		•			
Global and Community Health	•				
Global Studies	•				
History	•		•		•
History/Administrative Studies	•				
History/Law and Society	•				
Humanities, Arts, and Social Sciences Interdisciplinary	•				
Interdisciplinary Studies[2]	•				
Languages and Literatures					
– Chinese	•				
– Classical Studies	•				
– Comparative Ancient Civilizations	•				
– Comparative Literature	•				
– French	•				
– Germanic Studies	•		•[8]		•[9]
– Japanese	•		•[8]		•[9]
– Languages	•				
– Russian Studies	•				
Latin American Studies	•				
Law and Society[1]	•				
Liberal Studies	•				
Linguistics	•				
Management			M.A.[4], M.S. M.B.A., M.PAc., M.Fin., PROFESSIONAL M.B.A.		•
Mathematics	•	•	•	•	•
Mathematics, Applied				•	
Mathematics for Secondary School Teachers		•			
Media and Cultural Studies	•				
Medicine					M.D.
Microbiology[5]	•	•		•	•
Middle East and Islamic Studies	•				
Music	•		•		•
Music and Culture	•				
Native American Studies	•				
Neuroscience	•	•		•[4]	•
Pest Management				•[8]	
Philosophy	•		•		•
Philosophy/Law and Society	•				
Physical Sciences[2]	•				
Physics	•	•	•	•	•
Plant Biology	•	•		•	•
Plant Biology (Plant Genetics)					•[8]
Plant Pathology				•	•
Political Science	•		•		•
Political Science/Administrative Studies	•				
Political Science/International Affairs	•				
Political Science/Law and Society	•				
Political Science/Public Service	•				
Population Biology					•[8]
Psychology	•	•	•[4]		•
Psychology/Law and Society	•				
Public Health			M.P.H.		
Public Policy[5]	•		M.P.P. M.D. – M.P.P.		
Religious Studies	•		•		•
Religious Studies/Administrative Studies	•				
Sociology	•	•	•[4]		•
Sociology/Administrative Studies	•	•			
Sociology/Law and Society	•	•			
Soil and Water Sciences	•[8]	•[8]			
Southeast Asian Studies				•	•
Spanish	•		•		•
Statistics[5]	•	•		•	
Statistics, Applied					•
Sustainability Studies[2]		•			
Theatre, Film and Digital Production	•				
Visual Art			M.F.A.		

Undergraduate Minors

African American Studies
Anthropology
Art History
Asian American Studies
Asian Studies
Athletic Leadership
Black Study
Business
- Accounting
- Business Analytics
- Finance
- General Business
- Information Systems
- Management: Organizational Behavior/Human Resources
- Management: Strategy and Entrepreneurship
- Marketing
- Operations and Supply Chain Management

Chemistry
Chicano Bilingual-Bicultural Studies
Chicano Studies
Computer Science
Creative Writing
Dance
Data Science
Economics
Education
English
Entomology
Environmental Sciences
Environmental Studies
Ethnic Studies
Feminist Studies
Geology
Geophysics
Global and Community Health
Global Climate Change
Global Studies
History
International Relations
Journalism
Labor Studies
Languages and Literatures
- Arabic
- Chinese
- Classical Studies
- French
- Germanic Studies
- Italian Studies
- Japanese
- Korean
- Russian Studies
- Southeast Asian

Law and Society
Marxist Studies
Mathematics
Media and Cultural Studies
Medical and Health Humanities Studies
Middle East and Islamic Studies
Music
Native American Studies
Neuroscience
Peace and Conflict Studies
Philosophy
Physics
Planetary Sciences
Plant Biology
Political Science
Psychology
Public Policy
Queer Studies
Religious Studies
Speculative Fiction and Cultures of Science
Sociology
Southeast Asian Studies
Spanish
Statistics
Theatre, Film and Digital Production
Urban Studies
Western American Studies

Designated Emphases

Book, Archive, and Manuscript Studies
Cell, Molecular and Behavioral Neuroscience
Chemistry Education
Corporeality and Embodiment
Inflammation and Infectious Disease
Latin American and Latino Studies
Mechanisms of Gene Expression and Regulation Studies
Medical and Health Humanities
Middle East and Islamic Studies
Public Policy
Southeast Asian Studies

INTRODUCING UC RIVERSIDE

SCHOOL COLORS:	Blue and Gold
CLASSES BEGAN:	1954
CAMPUS MASCOT:	Highlanders/Scotty the Bear
LOCATION:	Southern California, conveniently located near mountains, desert, and beaches
2024 ENROLLMENT:	22,599 undergraduates; 3,785 graduates
CAMPUS TOURS:	TOUR@ucr.edu; visit.ucr.edu
UCR ON THE WEB:	ucr.edu

UC Riverside is a major research university and one of the 10 University of California campuses. A national center for the humanities, it offers students a supportive, collegial learning environment with nationally and internationally recognized faculty dedicated to the highest standards in research, teaching, and public service.

Located on nearly 1,200 acres near the Box Springs Mountains in Southern California, the park-like campus provides convenient access to the vibrant and growing Inland region and to local mountains — home to some of the best skiing and snowboarding in the region — beautiful beaches, amusement parks, golf courses, and outstanding shopping and entertainment.

The University is in the city of **Riverside**, a community of approximately 300,000 people. Located east of Los Angeles and north of San Diego, the area enjoys a year-round temperate climate and an exceptional quality of life with its architectural beauty, cultural art museums, quality housing, and wide variety of recreational opportunities. UCR is an integral part of the Riverside community through its partnership programs and the involvement of both employees and students in community activities and programs.

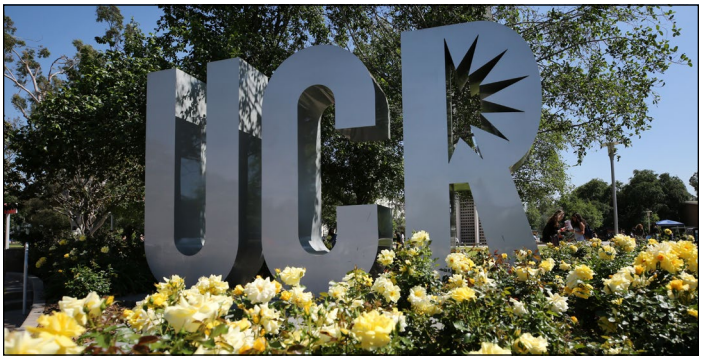
The nearby Ontario International Airport has daily flights to most of the nation's major cities and connecting commuter flights to Los Angeles International Airport. Metrolink train service is available to Los Angeles.

History

The roots of the campus date back to 1907, when the California State Legislature established the Citrus Experiment Station to conduct research on the agricultural problems of Southern California. In 1948, the University of California Regents approved the establishment of the College of Letters and Science, and the college opened for classes in February 1954. The University's Graduate Division was established in 1960.

Since then, the University's growth has mirrored the growth of Southern California. Once a small university in a small town, UC Riverside is now the premier research and educational instiitiution in thriving Inland Southern California.

The UCR Palm Desert campus provides educational programs, research, and outreach to meet the higher education needs of the greater Coachella Valley region.



Academic Distinctions

College of Humanities, Arts, and Social Sciences

is the largest and most diverse college at UCR, housing 22 departments and 60+ majors, minors, and interdisciplinary programs that explore human existence through humanistic study, creative activity, and social scientific inquiry. It is home to renowned programs, including a ground-breaking Public History program and one of the highest ranked Philosophy departments globally, and new, innovative interdisciplinary ones, including Black Study and Society, Environment, and Health Equity. The college's largest program, Psychology, is recognized for engaging undergraduate and graduate students in a wide range of research areas in neuroscience, development, and personality. The college has the only UC undergraduate major in Creative Writing, a unique Critical Dance Studies graduate program, and an arts outreach program funded by the Gluck Foundation, one of only three nationally. Visit chass.ucr.edu.

College of Natural and Agricultural Sciences (CNAS)

is home to world-renowned scholars pursuing research that deepens our knowledge of the universe we live in and improves the quality of life for inhabitants of the state, the nation, and the world. Central to this research is educating the students who come to CNAS to learn science, and who leave with an integrated grasp of how they can change the world. These students, and the faculty who teach them, benefit from a structure that is unique among land-grant colleges: CNAS's 13 departments encompass the life, physical, mathematical, and agricultural sciences. This structure encourages an extraordinary degree of collaboration, reflected in the interdisciplinary research centers and the many cooperatively taught degree programs. Modern science is team based, and CNAS embodies that principle in everything it teaches and practices. For more information about CNAS, please visit cnas.ucr.edu.

The Marlan and Rosemary Bourns College of Engineering

Researchers excel in study of alternative-fueled engines and vehicles, conversion of biomass to vehicle fuel, and air pollution. Majors include bioengineering; computer science and engineering; computer science with business applications; chemical, computer, data science, electrical, environmental, and mechanical engineering; as well as materials science and engineering. Visit www.engr.ucr.edu.

The School of Business offers the UC's oldest and most comprehensive undergraduate Business Administration major in Southern California and is the first and only one in the UC system that offers the B.S. in Actuarial Science degree. The School of Business houses The A. Gary Anderson Graduate School of Management, which offers the Master of Business Administration program (M.B.A.), the professional M.B.A. program, the Master of Professional Accountancy (M.P.Ac.) program, the Master of Finance (M.Fin.) program, Master of Science in Business Analytics (MSBA), and the Ph.D. program in Business Administration. The School of Business is accredited by AACSB International – The Association to Advance Collegiate Schools of Business. Visit business.ucr.edu.

The School of Medicine offers a doctorate in medicine (M.D.), master's (M.S.) and doctorate (Ph.D.) in Biomedical Sciences, and master's in public health (M.P.H.). The school seeks students with diverse intellectual and life experiences who have a desire to improve healthcare in Inland Southern California. Our Pathway Programs office helps local high school through college students navigate their unique educational path towards careers in health and medicine, all with the goal of improving health in the region. Visit **medschool.ucr.edu**.

School of Education

The breadth and depth of the programs offered at the School of Education (SOE) is extraordinary, reflecting faculty expertise and research in such areas as autism; culture and language; higher education; issues of diversity; intervention for children with reading difficulties; policy; and qualitative and quantitative methods. The school offers an undergraduate major in Education, Society, and Human Development, two minor programs, research-focused M.A. and Ph.D. programs, M.Ed. professional programs, and teacher credential programs. Visit **education.ucr.edu**.

School of Public Policy

Established in 2012, the UCR School of Public Policy (SPP) is home to the only Master of Public Policy (MPP) program offered by a major research university in inland Southern California, as well as one of only two undergraduate public policy programs in the ten-campus University of California system. SPP's BA/MPP program will allow students to obtain both BA and MPP degrees through an integrated five-year plan of study. This program prepares students for policy and public service careers at the local/community, regional, and national levels as well as for pursuing doctoral degrees in relevant disciplines. With its motto, "Solutions for the Region, Solutions for the World," the UCR School of Public Policy is distinctive in its focus on addressing the big policy challenges facing California – and in particular the inland region – while placing an emphasis on applying policy lessons learned from other parts of the nation and the world to solving California's problems. For more information, visit **spp.ucr.edu**.

Principles of Community

The University of California, Riverside is committed to equitable treatment of all students, faculty and staff. UCR's faculty, staff and students are committed to creating an environment in which each person has the opportunity to grow and develop, and is recognized for their contribution.

There are three objectives that our campus must strive toward in order to achieve these goals.

- First, we must ensure that we have an environment that nurtures the intellectual and personal growth of our students, faculty and staff.
- Second, we must ensure that our campus sets an example of respect for all people.
- Third, we must ensure that our campus is a safe and welcoming environment for everyone.

We take pride in the diversity of the campus community and in ourselves by using the campus environment as a place, committed to academic integrity, where all members are encouraged to use their unique talents to enrich the daily life of the community in which they live, work, teach and learn. Respect for differences and civil discourse must become the hallmark of how we live and work together to build our community of learners at UCR.

We, as members of the University of California, Riverside, affirm our responsibility and commitment to creating and fostering a respectful, cooperative, professional and courteous campus environment. Implicit in this mutual respect is the right of each of us to live, study, teach and work free from harassment or denigration on the basis of race/ethnicity, age, religious or political preference, gender, transgender, sexual orientation, nation of origin, or physical abilities. Any violation of this right by verbal or written abuse, threats, harassment, intimidation, or violence against person or property will be considered a violation of the principles of community that are an integral part of the University of California's focus, goals and mission (and subject to sanction according to University policies and procedures).

We recognize that we will all need to continually work together to make our campus community a place where reason and mutual respect among individuals and groups prevail in all forms of expression and interaction.

Accreditations

UCR is a member of the Western Association of Schools and Colleges (WASC). The campus is fully accredited by the Western Association of Schools and Colleges (WASC) Senior College and University Commission (WSCUC). This accreditation requires periodic review in accord with WASC policies and standards. WASC is located at 985 Atlantic Avenue, Suite 100 Alameda, CA 94501, (510) 748-9001.

- The credential programs in the School of Education are approved by the California Commission on Teacher Credentialing.
- The School of Education School Psychology Ph.D. program is approved by the National Association of School Psychologists and accredited by the American Psychological Association and the California Commission on Teacher Credentialing.
- The Bachelor of Science programs in the Marlan and Rosemary Bourns College of Engineering, in Bioengineering, Chemical Engineering, Computer Engineering, Electrical Engineering, Environmental Engineering, Material Science and Engineering, and Mechanical Engineering are accredited by the Engineering Accreditation Commission (EAC) of ABET, **abet.org**, while Computer Science and Computer Science with Business Applications are accredited by the Computing Accreditation Commission (CAC) of ABET, **abet.org**.
- The School of Business and The A. Gary Anderson Graduate School of Management are accredited by **AACSB** International – The Association to Advance Collegiate Schools of Business.
- The M.D. programs in the School of Medicine are accredited by the Liaison Committee on Medical Education (LCME).

UC Riverside Resources at Your Fingertips

A–Z Listing

Use UCR's **A–Z Listing** to find almost anything on campus, including departments and organizations.

Academic calendar

Access important dates and deadlines by visiting the **academic calendar** on the Registrar's website.

Academic Resource Center (ARC)

Catch up or get ahead in class by participating in the **ARC's** academic support programs, such as Supplemental Instruction (SI), Early Assist, tutoring, and writing support. The R'Success Workshop Series and Assistance, Coaching, and Encouragement (ACE) peer mentoring program are also offered to help you develop skills and achieve academic and professional success.

Campus events

UCR offers virtual and in-person events, job fairs, lectures, conferences, performances, and more! Visit **events.ucr.edu** for a complete lineup.

Campus map

Access the **campus map** for building locations, point-to-point directions, parking lots, dining options, ATMs, water refill stations, and more.

Campus life

There are countless ways to get involved and inspired at UCR. We're home to a thriving arts community, one-of-a-kind events, and 500+ student organizations. We also offer the gorgeous 40-acre Botanic Gardens, the famed 22-acre Givaudan Citrus Variety Collection, KUCR (a noncommercial campus radio station), the largest photographic center in the western United States, more than 2 million books, and one of the world's largest cataloged collections of science fiction and fantasy. Be a part of an exciting **campus life**!

Campus Tours

There's no better way to get a feel for life at UCR than from a current student! Sign up for a one-hour **Family Tour** (student and up to four guests), or download a map to take a **self-guided tour** to explore the UCR campus at your own pace.

Not in the area? Take **virtual tours** of UCR colleges, residence halls, and life on the UCR campus. Then be sure to explore our vibrant city of **Riverside**.

Campus website

Campus Advocacy, Resources & Education (CARE)

CARE is an intervention and prevention support program committed to ending sexual violence at UCR. It seeks to unite, inspire, and cultivate a community culture of care by providing direct advocacy, resources, and prevention educational programming related to issues of sexual assault, relationship violence, and stalking to students, staff, faculty, and UCR affiliates.

Career Center

Become career-ready with the help of UCR's **Career Center**. Connect with career counselors via drop-in appointments and virtual career counseling. Attend in-person and virtual job fairs, access skill-building workshops and resources, and log into UCR Handshake to find internships, part-time, and full-time jobs.

Driving directions

Getting to UCR is easy — thanks to **Google Maps**! The campus address is 900 University Ave., Riverside, CA 92521.

Locate people and organizations

Browse **profiles.ucr.edu** to locate faculty, staff, students, organizations, groups, and research areas.

Student Health Center

UC Riverside Student Health and Counseling Center (SHCC) provides a range of **healthcare** and **mental health services** to currently enrolled undergraduate and graduate students, including primary care, women's health, pharmacy, x-ray and lab services. SHCC is offering virtual and in-person appointments. Please visit the patient portal to schedule an appointment.

Student Life

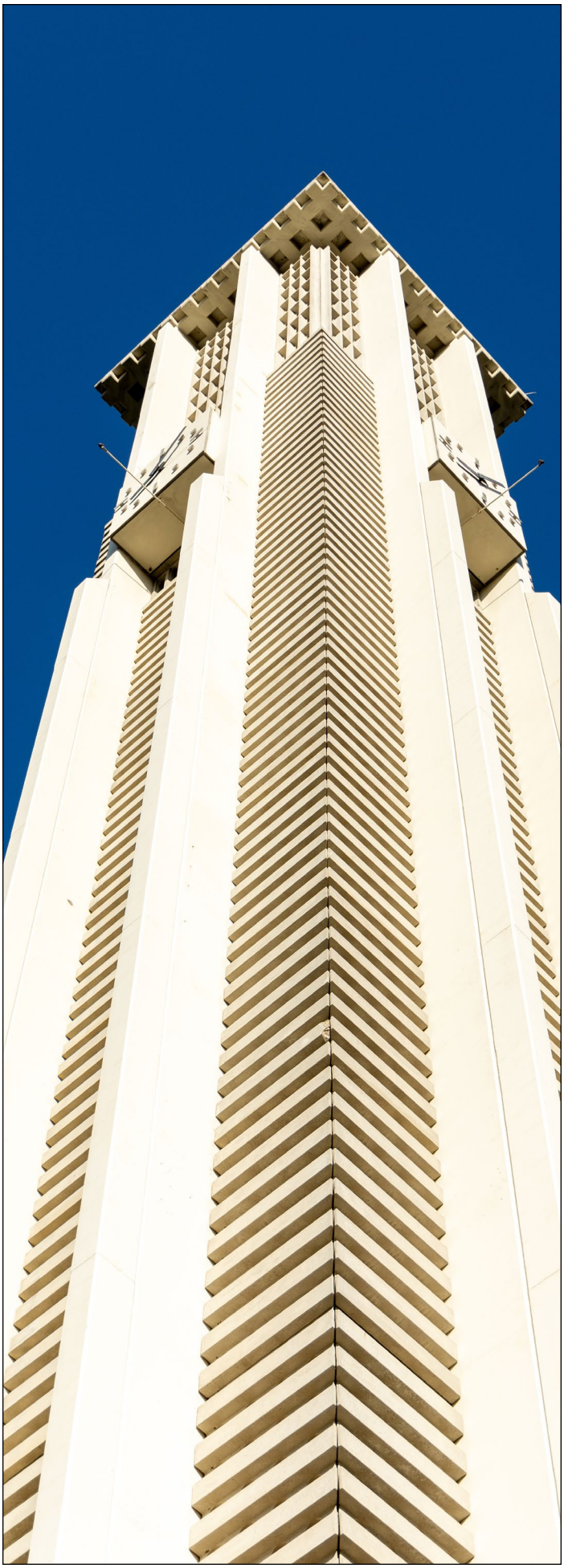
Student Life provides you with the total UCR experience. That means supporting opportunities for learning, leadership, community building, and creative expression that go way beyond the classroom. Get involved, join a student org, attend UCR's famous concerts, and so much more!

Transportation to and around UCR

Explore **Transportation Services** for all sorts of ways to travel to and around UCR. You'll also find information on parking permits, alternative transportation methods, and accessibility options.

Veteran resources

UCR welcomes **veterans**! Join a community of veteran and military-connected students, and enjoy a wide range of veteran-focused resources.



Resources for Learning

UCR ARTS

3824 & 3834 Main Street
Riverside, CA 92501
(951) 827-3755
ucrarts.ucr.edu

UCR ARTS opened to the public in 2010, bringing together the California Museum of Photography (founded in 1973), the Jack and Marilyn Sweeney Art Gallery (1963), and the Barbara and Art Culver Center of the Arts (2010). Located three miles from UCR's main campus, UCR ARTS is located on a single block in adjacent historical buildings along the pedestrian mall in downtown Riverside. Housed in two renovated department stores from the late 19th and early 20th centuries, UCR ARTS's adaptive reuse enlivens the city's downtown core.

By merging the already established photographic museum and university art gallery with the new, multi-disciplinary Culver Center, UCR ARTS serves as a cultural anchor for both the University and the broader Inland Empire communities. UCR ARTS organizes provocative and timely art exhibitions, performances, screenings, and other programs with the aim of invigorating the cultural life of artists and residents of Southern California, nurturing creative and critical thinking on campus and in the community, and promoting the importance of the arts for a healthy society. UCR ARTS offers innovative programs that engage diverse audiences, nourish the imagination, and challenge assumptions.

The extensive art, photography, and research collections of the CMP and Sweeney Art Gallery make UCR ARTS an important destination for audiences as well as researchers working in a wide range of fields.

UCR ARTS's activities embody UCR's commitment to broadly-based public education and cutting-edge research. As a university museum and art gallery, UCR ARTS is committed to offering students opportunities for professional museum work. Students from UCR and elsewhere are involved under the aegis of independent course status, internships, work-study, and as volunteers.

California Museum of Photography

The California Museum of Photography at UCR ARTS is devoted to showing the work of contemporary artists who use photography, collaborating with UCR faculty and students to bring their varied expertise to the public in exhibitionary form, and to preserving and making accessible its vast holdings of photography and related apparatus.

Barbara and Art Culver Center of the Arts

The Barbara and Art Culver Center of the Arts hosts art installations, a weekly film program, and musical, dance, and theatrical performances in a dynamic setting. Recognizing that artists play a crucial role in society, the Culver Center also hosts a robust program of lectures, symposia, and community forums with artists, filmmakers, playwrights, dancers, and musicians. The main level is home to an expansive atrium gallery beneath a 40' high skylight, the Sweeney Art Gallery, and a 72-seat screening room. On the second level, the Culver Center houses a Media Lab, two dance studios with sprung wood floors, a black box equipped with green screen, and a sound recording studio. In the lower level, the California Museum of Photography's important Keystone-Mast Collection of stereographs is preserved in state-of-the-art seismically isolated cabinets.

Information Technology Solutions

Associate Vice Chancellor and CIO: Matthew Gunkel
Computing and Communications Building
(951) 827-4741; its.ucr.edu

Information Technology Solutions provides technology services and support to faculty, staff, and students.

Network Services

(951) 827-4624; dial@ucr.edu

This division provides network and voice communication needs for the campus.

Bear Help

Helpdesk (951) 827-IT4U (4848); bearhelp@ucr.edu

This division provides desktop computing support to faculty and staff, including installations, troubleshooting, consulting, and assistance with acquiring and using stand-alone or networked desktop and laptop computers.

Multimedia and Classroom Technology

(951) 827-3041; multimedia.ucr.edu

This division provides support with classroom technology and multimedia systems to support faculty, staff, and students with their academic and nonacademic events.

Student Technology Support

(951) 827-IT4U (4848); bearhelp@ucr.edu

Supports campus computer labs, student e-mail, Canvas, wireless network, and VPN. Computer Labs are available in Watkins Hall and the Arts Building. WEPA printers (aka web printing) are available throughout the UCR campus. Students can also check out laptops from laptop kiosks located in the Student Success Center, Rivera Library, Orbach Library, and the HUB.

University Library

University Librarian: Dr. Mihoko Hosoi
(951) 827-3221; library@ucr.edu

The UCR Library serves as the information commons, intellectual center and nexus for research and study on campus. Our collections include more than 4.2 million print volumes, more than 1 million e-books, 143,000 serials, and thousands of multimedia materials. The library also provides access to hundreds of databases and state-of-the-art information technology. Two library facilities (Tomás Rivera Library and Raymond L. Orbach Science Library) offer wireless network access on-site, and UCR students, staff and faculty can remotely access the library's electronic databases and e-resources. Ranked among the 124 largest research libraries in the U.S. and Canada, the UCR Library is a member of the Association of Research Libraries, the Coalition for Networked Information, and the Digital Library Federation.

In addition to our collections, our librarians and staff can provide a variety of services designed to enhance the academic experience, including Ask a Librarian, Creat'R Lab, Research Services, Teaching & Learning, Special Collections & University Archives, Interlibrary Loan/Document Delivery Services, Digitization Services, and Course Reserves. We also have Collection Strategists who can help acquire content in support of research, teaching and learning.

Library facilities offer many comfortable spaces for intellectual exploration, collaboration and relaxation including technology-enhanced group study rooms (some of which can be reserved online), media viewing and gaming rooms, mediascapes, study carrels, tables, and comfortable chairs and couches.

Rivera and Orbach Libraries lend headphones, calculators, charging cables, marker sets, and other items. Computers, laptops you can check out, printers, and scanners are available in both libraries.

During the academic year, Rivera and Orbach Libraries are open until midnight Monday through Thursday, and Orbach Library is open even later during finals week. Hours vary during intersession and summer quarter. Check library.ucr.edu/hours for current library hours.

Tomás Rivera Library
(951) 827-3220, library@ucr.edu

Rivera Library provides access to materials in the humanities, social sciences and arts, housing more than 2,000,000 print volumes. It also houses Special Collections and University Archives, XCITE, GradVantage graduate student instructional support services, and the Pre-Professional Advising Center (PPAC).

Raymond L. Orbach Science Library
(951) 827-3701, library@ucr.edu

Materials in Orbach Library support the life and physical sciences, including engineering, agriculture, and medicine. It also houses the Creat'R Lab, the Scholarly Technology and Research (STAR) Lab and other specialty labs, a poster printing service, and the Geospatial Resources section.

Services

Ask Us
For quick questions, text (833) 450-3355 and start your message with **ucrlib**. (Example: "ucrlib what time can I drop off reserves until?") **Online chat** also available 24/7 at: https://library.ucr.edu/ask

Course Reserves
library.ucr.edu/course-reserves

The UCR Library offers course reserve services that allow instructors to set aside textbooks and other research material for students to check out as an alternative to purchasing textbooks.

Creat'R Lab
Orbach Library, first floor
Rooms 140, 144 & 145
library.ucr.edu/creatr-lab

Open to all UCR students and faculty, the Creat'R Lab is an innovation makerspace for learning, experimenting, designing and collaborating; this is where new technologies, curiosity and creativity come together. Equipment includes 3D printers, 3D scanners and associated software, basic hand tools, electronics for prototyping, tools for working with textiles, paper, and more.

Scholarly Technology and Research (STAR) Lab
Orbach Library, first floor
Room 147
library.ucr.edu/using-the-library/technology-equipment/specialty-labs

This computer lab has four high-performance Windows PC workstations and one Epson Photo Scanner. All STAR Lab workstations provide specialized software for data analysis, data visualization, AV and multimedia editing, computer-aided design (CAD), geographic information systems (GIS), network analysis, version control, and citation management.

Research Services
(951) 827-3316
library.ucr.edu/research-services

The Research Services department provides consultations, resources and services focused on finding and using information resources, planning and conducting research and digital scholarship projects, working with data, mapping and geospatial information, publishing and sharing research, and innovating with 3D printing and maker technologies.

Teaching & Learning
(951) 827-4392
library.ucr.edu/instructional-support

The department of Teaching and Learning supports student success by providing course-related instruction to develop library and information literacy skills, online learning modules through Canvas, designing library guides for course research, and providing consultations beyond course-related library instruction.

GradVantage
(951) 827-4392
library.ucr.edu/instructional-support

A partnership between GradSuccess and UCR Library Teaching and Learning, GradVantage offers dedicated space, expertise, and programming to support and develop graduate students in their role as instructors. Housing the offices of the TA Development Program, the TA Teaching Certificate, and Assessment, Instructional Design, and Educational Technologist librarians, GradVantage continues the expansion of resources for excellence in teaching available on the first floor of Rivera Library.

Interlibrary Loan (ILL) and Document Delivery Services
UCR students, faculty, and staff may use ILL to borrow materials from other libraries.

Document Delivery Services offers paging of books and journal articles located at the UCR Library. This service is provided to UCR faculty, staff, and students.

Poster Printing
Orbach Library, Room 121

UC Riverside students, faculty, and researchers can print academic documents up to 12' long. Accepted payments are Bear Bucks or department recharge.

For hours, guidelines, policies, pricing, and general information, visit: guides.lib.ucr.edu/plotter

Distinctive Collections

K-12 Curriculum Resources
Basement, Rivera Library

The circulating collection of K-12 Curriculum Resources offers a variety of materials, textbooks, and award-winning children's literature to support the work of students in the School of Education's Teacher Education programs.

Geospatial Resources
Main floor, Orbach Science Library
guides.lib.ucr.edu/gismaps

The Geospatial Resources Area houses maps covering the state of California down to the local level and aerial photographs of Riverside and San Bernardino counties dating back to 1938. Other maps and atlases are managed by Special Collections & University Archives in Rivera Library.

Government Documents
Main floor, Rivera Library
(951) 827-4392

The UCR Library serves as a selective depository for U.S. federal and California state government publications.

Special Collections & University Archives
Rivera Library, fourth floor
(951) 827-3233

Special Collections contains an extensive collection of rare books, manuscripts, archives and other unique or fragile materials in subject areas including agricultural, botanical and natural sciences, STEM related subjects, local and State history, Latin American studies, literary and cultural studies, ethnic studies, dance, artists' books, miniature books, and art history. In addition to the collections described below, notable collections include the Citrus Experiment Station records, the Sadakichi Hartmann Papers, the Oswald Jonas archive, the Avery E. Field photograph collection and the Sabino Osuna papers.

University Archives houses the official historical records of the University of California, Riverside including faculty papers and documentation of student life and activities.

Tomás Rivera Archive
In 1985, the Rivera Library was re-named for **Tomás Rivera**, the first Mexican-American UC Chancellor (UCR 1979-1984). The Archive includes approximately 85,000 items including biographical works and correspondence, as well as literary, educational, and civic materials. Rivera's legacy as Chancellor, educator, poet, novelist, and civic leader are captured in the depth of the archive.

Water Resources Collections and Archives (WRCA)
Located in both the Rivera Library's fourth floor and throughout the STEM collections in Orbach Library, the WRCA is the premier collection devoted to

water resources in California and the west, including more than 280 archival collections, 180,000 technical reports, 6,000 archival maps, and 45,000 historic photographs pertaining to water development from the 1900s to the present.

Eaton Collection of Science Fiction and Fantasy

One of the world's largest, richest and deepest research collections of science fiction, fantasy, horror, utopian literature and related genres, the Eaton Collection contains more than 100,000 printed books, full runs of most pulp magazines, approximately 100,000 fanzines, film and visual material (including 500 shooting scripts from science fiction films), and the archives of prominent writers including Robert Forward, Jerry Pournelle, Anne McCaffrey, and the Poul & Karen Anderson papers. Also included are collectibles, ephemera, and realia as well as almost 100,000 comic books, anime and manga.

Tuskegee Airmen Collections

Part of a national effort to collect and preserve the history of the first African Americans to serve as pilots in the U.S. Army Air Force in World War II, the Tuskegee Airmen Collections contain personal letters, diaries, photographs, memorabilia, posters, oral history interviews, documentation of careers before, during, and after military service as well as books by and about the Tuskegee Airmen, and African American military history.

Rupert Costo Library of the American Indian

The Costo Library documents Native American history and culture in multiple-media formats including approximately 7,000 volumes and more than 9,000 documents, pamphlets, tape recordings, slides, baskets, pottery and artwork. The Costo Library was donated by Rupert and Jeanette Costo, co-founders of the American Indian Historical Society. Rupert Costo (Cahuilla) was a Native American author, publisher, and philanthropist. Jeanette Costo (Eastern Cherokee) was a journalist and activist.

Educational Opportunities

California Teach-Science and Mathematics Initiative (CalTeach-SMI)

Leslie Bushong, Director
Resource Center, 1114 Pierce Hall
(951) 827-4970; smi.ucr.edu
facebook.com/ScienceMathInitiativeAtUcr
instagram.com/smiatucr/

California Teach-Science and Mathematics Initiative (CalTeach-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CalTeach-SMI at UCR offers undergraduate students paid/unpaid opportunities to explore STEM teaching as a career option. Through CalTeach-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The CalTeach-SMI Resource Center provides future STEM teachers with material and financial resources to promote planning and professional development towards a science/mathematics education career.

Center for Undergraduate Research and Engaged Learning (CUREL) Programs

Student Services Building #2106
(951) 827-7389
engage.ucr.edu

Capital Internships (UCCS + UCDC)

UC Center in Sacramento (UCCS) and UC Washington Center (UCDC) combine coursework and professional experience while living, interning, and attending classes in Sacramento or Washington, D.C.

Chancellor's Research Fellowship (CRF)

The Chancellor's Research Fellowship (CRF) is a competitive award that supports undergraduates in faculty-mentored research and creative activity projects. This award is open to promising undergraduate researchers in all disciplines.

Community Engaged Learning

Community engagement allows students to conduct faculty-mentored research in support of the community. Additionally, students can connect with on and off-campus departments and non-profit organizations for volunteer opportunities to help them engage in the community, and group service events.

EXCEL+ Career Readiness and Leadership

The EXCEL+ Career Readiness and Leadership program is designed to assist UC Riverside students in articulating career readiness skills obtained through participation in courses, high-impact programs and extracurricular activities.

Global Accelerator

An innovative, online experiential program offering students the opportunity to develop global competencies and gain real-world work experience. Participants collaborate with peers from 50+ countries on projects for leading companies like Spotify, Netflix, Intel, and the GRAMMYS. Students can earn up to 8 academic credits and 4 micro-credentials focused on key industry tools. The flexible, virtual format prepares students for success in today's global, remote, and hybrid work.

Prestigious Scholarships and Awards

CUREL is dedicated to empowering students as they pursue prestigious national and international awards. Through comprehensive support – including personalized mentorship, expert writing guidance, and strategic advising – CUREL helps students navigate every stage of the application process with confidence and clarity.

Mini Grants

CUREL supports students in writing research funding proposals to support their faculty-mentored, research and creative projects of their design, as well as student travel to present their research at conferences.

Tilga Scholarship

The Tilga Scholarship provides financial support to UCR undergraduate students who participate in unpaid internship opportunities. This scholarship is designed to reduce financial barriers and promote equitable access to experiential learning. Ideal applicants will demonstrate a strong commitment to their professional development. Preferred consideration is given to students participating in the EXCEL+ Leadership and Career Readiness Program.

Undergraduate Research Journal

The Journal is a student-edited, multidisciplinary journal that features the very best faculty-mentored undergraduate research and scholarship accomplished at UCR. Professional staff provide targeted writing support for journal submissions.

Undergraduate Research & Creative Activities Symposium

The Symposium celebrates undergraduate research and creative activities across all disciplines at UC Riverside. The event provides a positive learning experience for presenters to refine their oral communication skills and for guests to learn about the various research projects.

R'Courses

1 unit, S/NC offerings facilitated by UC Riverside undergraduate students that design and lead their own original courses. Each course has a faculty instructor of record who provides mentoring and support behind the scenes. Students develop leadership skills, to innovate the undergraduate curriculum, and to promote democratic, experiential education to campus.

uResearch Portal

The uResearch Portal is a one-stop shop for students to find opportunities to participate in faculty-mentored research, scholarship, and creative activities.

Education Abroad

Student Services Building, Second Floor
educationabroad@ucr.edu
international.ucr.edu/abroad
(951) 827-4113

Increase your employability – get international experience!
Education abroad includes studying, working, and living in another country. Education Abroad at UCR provides students with high-quality international opportunities through academic coursework and experiential learning abroad. We help students acquire the skills to work in a global marketplace and provide support like advising.

Go abroad on UCR's many education abroad programs like the UC Education Abroad Program (UCEAP), a faculty-led education abroad program (FLEAP), or an independent opportunity abroad program (OAP). You can go abroad for one week or a year and take most, if not all, of your financial aid. There are also scholarships.

Education abroad provides a competitive edge in the job market. It's a transformative experience that allows you to learn about yourself, become more confident, and develop a broader perspective of the world. Employers know that students who study abroad have intercultural understanding, adaptability, and skills to succeed in a multicultural environment. Students gain a career edge in an increasingly globalized market by going abroad.

Studies show that the biggest regret of undergraduates across the nation is not taking advantage of education abroad. Don't let this be your regret. Studying, working, and living in another country is a unique chance to broaden your horizons, gain new perspectives, and enhance your employability. So why wait? Seize this opportunity now and start your journey abroad with UCR.

Faculty Led Education Abroad Program (FLEAP) – take UC courses in an international setting with UCR professors, in which you could conduct research, collaborate with students from other countries, and experience another culture.

When you study abroad through FLEAP, you:
- Remain enrolled at UCR, earning UC credits;
- Use eligible federal, state, and UC financial aid;
- Apply for scholarships and grants;
- Enjoy small classes and close interaction with your UCR faculty.

UC Education Abroad Program (UCEAP) – the University of California's system-wide education abroad program provider offers all the benefits of home: UC credit, grades, and financial aid.

When you study abroad through UCEAP, you:
- Remain enrolled at UCR, earning UC credits;
- Use eligible federal, state, UC financial aid and grants;
- Access UCEAP scholarships and awards;
- Enjoy internationally recognized health and safety support;
- Can choose from over 40 country destinations worldwide;
- Take courses at a highly ranked host university abroad.

Opportunities Abroad Program (OAP) – any type of abroad experience offered by other UC campuses and non-UC education abroad programs which are governed by UCR's Planned Opportunities Abroad Agreements (POAA; see Withdrawals and Leaves of Absence section about POAA).

When you study abroad through OAP, you:
- Are on a leave of absence through POAA and earn transfer credit;
- Use eligible federal and state aid;
- Apply for scholarships and grants;
- Enjoy many options with the flexibility to study abroad with other abroad programs.

Highlander Early Start Academy (HESA)

Offers incoming first-year students an opportunity to prepare for the academic rigors and challenges of UCR in the summer before their 1st fall quarter. Students must have placed into English through the Analytical Writing Placement Exam (AWPE), OR Math through the Math Placement Assessment (MPA) to be eligible. HESA participating students will take a primary course (English or Math), a secondary course, and a College Success Course for a total of 8-10 units. The goal of this program is to enhance English & Math skills, support incoming first-year students during the transition from high school to university, connecting them to campus resources for academic and personal success, and helping to build a community with fellow HESA peers. earlystart.ucr.edu; earlystart@ucr.edu

Honorary Societies

To learn more about these organizations:
highlanderlink.ucr.edu

Gamma Beta Phi is a national collegiate honorary and service society that recognizes and encourages educational excellence, develops leadership and character in its members, and fosters, disseminates, and improves education through appropriate service projects. It recognizes students ranking in the top 20 percent of their class.

Mu Sigma Rho is a national statistics honor society seeking to promote and encourage scholarly activity in statistics as well as recognizing outstanding achievements among students and faculty. Students must have a 3.25 GPA and have a certain amount of statistics courses and class standing to be eligible.

National Residence Hall Honorary aids the development and maintenance of a strong, diverse and academically successful residential community within the UCR Residence Halls. Students must be in the top one percent of the residence hall population.

Order of Omega is a national honor society to recognize junior and senior members of social Greek letter organizations with a minimum 3.0 cumulative GPA for their service to the Greek system and the university. It honors the top 3 percent of the university Greek population for excellence in academics, leadership and campus or community service.

Phi Beta Kappa, founded in 1776, is the oldest and most distinguished academic honor society in the United States. Approximately 10 percent of seniors majoring in liberal subject areas of the arts and sciences are eligible for membership. UCR's IOTA chapter reviews the records of eligible students and elects members on the basis of scholarly achievement, character, and broad cultural interests. All prospective members must have the equivalent of level four (intermediate skill level) of a foreign language and some significant evidence of breadth, through courses beyond those required for the major or by the student's college, or through other demonstration of academic excellence across a diversity of fields. Students are nominated for induction each spring quarter.

Psi Chi National Honor Society in Psychology was founded in 1929 for the purposes of encouraging, stimulating, and maintaining excellence in scholarship and advancing the science of psychology. Society members must rank in the top 35 percent of their class with a minimum 3.0 cumulative GPA.

Tau Beta Pi (National Engineering Honor Society) marks those who have conferred honor upon their alma mater by distinguished scholarship and exemplary character as students, or by their attainments as alumni. Students rank in the top 1/8 of the junior class or top 1/5 of the senior class.

Tau Sigma National Honor Society recognizes the academic achievement of students transferring to an institution of higher learning from another academic institution, and encourages and promotes the students' involvement in the institution to which they have transferred. Tau Sigma students rank in the top 20 percent of their class with a 3.5 GPA.

Reserve Officer's Training Corps

Students may, with the permission of the dean of their college, enroll in ROTC courses at another institution while completing their degree programs at UCR. Students interested in Air Force or Army ROTC should contact the Office of the Registrar at (951) 827-7284 or **reghelpdesk@ucr.edu** for information on special program enrollment. Descriptive pamphlets summarizing the programs are available at the UCR Career Center.

Air Force Reserve Officer Training Corps (AFROTC) is a nationwide program that allows students to pursue commissions (become officers) in the United States Air Force (USAF) while simultaneously attending college. AFROTC consists of four years of Aerospace Studies classes (Foundations of the USAF, Evolution of USAF and Space Power, Air Force Leadership Studies, and National Security Affairs/Preparation for Active Duty), and a corresponding Leadership Laboratory for each year (where students apply leadership skills, demonstrate command and effective communication, develop physical fitness, and practice military customs and courtesies). College students enrolled in the AFROTC program (known as "cadets") who successfully complete both AFROTC training and college degree requirements will graduate and simultaneously commission as Second Lieutenants in the Active Duty Air Force.

Classes are offered at California State University, San Bernardino; however, UCR students may enroll using our cross-enrollment agreement. For more information on AFROTC course descriptions, please review **catalog.csusb.edu**. For more information on the AFROTC program, please call (909) 537-5440 or visit **afrotc.csusb.edu**.

Army Reserve Officers' Training Corps (AROTC)

Student Services Building #2106
(951) 827-7389
armyrotc.ucr.edu

UC Riverside AROTC is one of six universities in the Claremont McKenna College Golden Lions designed to teach, coach, and mentor cadets on their academic and leadership development journey prior to becoming commissioned officers in the United States Army. AROTC Cadets currently earn academic credit for AROTC courses through a cross-enrollment procedure with California State University, San Bernardino. Students participate in the cross-enrollment process with the permission of their college dean. Academic units earned in AROTC programs are counted as elective units toward UC Riverside graduation requirements.

Summer Sessions

Director of Administration Leonard Taylor
Student Services Building
(951) 827-3044; **summer.ucr.edu**

Summer Sessions offers over 650 regular UCR courses in multiple, abbreviated summer sessions, giving students the opportunity to expedite time to graduation, take hard-to-get classes, improve their GPA, get back on academic track, perform research with faculty, and seek professional development or enrichment courses. On campus housing options are available during the summer for both UCR and visiting students. UCR students are eligible for Financial Aid and should talk to their Financial Aid counselor for more information.

Who May Attend? Summer term is open to all UC and non-UC students with a high school degree, or to those who are at least 18 years of age. Students do not have to be admitted to the university to attend Summer Sessions. Please visit **summer.ucr.edu** for the visiting student application form and for more information. Admission to Summer Sessions does not constitute admission as a regular student of the University.

Credits, Grades, and Units

UCR courses are normally transferable to other institutions and applicable degree programs. For UCR students, summer quarter credits and grades are automatically placed on their official transcript of record. UCR continuing students wishing to take courses in excess of 15 units for the entire summer must have the approval of their advisor or their college's Associate Dean; all other students must have the permission of the Summer Sessions Director of Administration. UCR students in dismissed status must seek approval from their advisor or the Associate Dean from the college they wish to readmit to before registering for Summer Sessions.

UC Riverside Extension

UC Riverside Extension
1299 University Ave., Suite 201
Riverside, CA, 92507
(951) 827-4105; fax (951) 827-7278
register@ucx.ucr.edu; **extension.ucr.edu**

UCR Extension is the continuing education branch of the university. Extension programs are open to anyone seeking higher education. University Extension offers degree credit; postgraduate continuing education credit; and noncredit programs for pursuit of intellectual and cultural interests, professional and career advancement, and examination and study of a variety of topics and subject areas. Current and former undergraduate students can enhance their degrees through one of the specialized Professional Certificate Programs.

UCR Extension provides a range of educational opportunities and formats, including concurrent enrollment in UCR campus courses, XR courses, weekend and one-day conferences, and intensive and online Certificate Programs. Intensive English and other programs for non-matriculated international students and international groups are available throughout the year. Students do not need to be admitted to a degree program at UCR to enroll in Extension's courses or programs.

Degree Credit

Credit earned in certain Extension courses may be applicable to degree requirements at the time of admission to the university. (See University of California Extension Courses in the Program and Courses section.) Students should check with the Office of Undergraduate Admissions about the applicability of such credit. Resident students in the university wishing to apply Extension credit to degree requirements must have advanced approval from the dean of their college or division before enrolling in Extension courses.

International Education Program

UC Riverside Extension
1299 University Ave., Suite 201
Riverside, CA, 92507
(951) 827-4105; fax (951) 827-7278
iepapplication@ucx.ucr.edu; **extension.ucr.edu**

Offers a wide variety of English language, Certificate and Diploma programs for international students and professionals on a year-round basis. Also offers academic pathways for students wishing to study at UCR and other U.S. colleges and universities, and opportunities for visiting international students to take UCR credit courses, on a space available basis.

Offers the following programs:

- Intensive English
- University Credit Program
- UCR Admission Preparation Program
- Graduate Pathway Programs
- Disney Academic Exchange Program
- Several intensive professional programs including postgraduate diplomas in management, engineering, artificial intelligence, and sports management.

UC Riverside Palm Desert Center

Executive Director: Agam Patel
75080 Frank Sinatra Drive
Palm Desert, CA 92211
(760) 834-0800; fax (760) 834-0796
palmdesert@ucr.edu; **palmdesert.ucr.edu**

The UCR Palm Desert Center expands the reach of University of California, Riverside into one of the fastest growing regions of California. Established as a teaching and research center in 2005, the UCR Palm Desert Center is a catalyst for diversification of the inland desert region by providing relevant regional research, offering innovative programs that attract and retain world class talent to the region, convening and creating partnerships that advance the public good, and enriching the cultural life of the community.

University of California Washington Center (UCDC) Academic Internship Program

Student Services Building # 2106
(951) 827-2634
engage@ucr.edu; ucdc.ucr.edu

This program provides undergraduate students with a multi-dimensional education experience in Washington, DC. Students undertake academic pursuits as well as cultural and social activities. The program combines course work with field research and internship experience. Students also have the opportunity to tour local sites and dialogue with distinguished professionals in the Speaker Series.

Students from all majors can benefit from the program.Visit ucdc.ucr.edu for information about internships and links to other job search sites. The UC Washington Center is located in downtown Washington, DC, six blocks from the White House. The UC Washington Center is an innovative teaching and research facility shared by all of the UC campuses that has classrooms, faculty and staff offices, a modern computer lab, and a student lounge, as well as living facilities for all participants in the program.

Academic Program
Students may enroll in 12 to 16 units of course credit for the quarter.

Internship (8-16 units). Letter grade only
The focal point of the academic program is the internship, which is based on the students' interests and major, and is arranged before the student leaves for Washington, D.C. May be letter graded or S/NC depending on discipline. Visit ucdc.ucr.edu for sample internships.

Core Research Seminar (4 units)
UCR students meet once per week with a faculty member in residence at the UC Washington Center in D.C. Academic assignments focus on understanding the city of Washington, D.C., its history, politics and culture. Offered for a letter grade.

Interdisciplinary Elective (4 units)
Serves as a weekly forum for students to share and enhance their knowledge of living and working in Washington, D.C. Students will read about, experience and analyze key sites in a multi-disciplinary context. Offered for a letter grade.

Academic Planning/How to Apply
Interested students should consult well in advance with their academic advisors and the UCDC program staff to determine how participation in the program will affect their degree progress. Consult ucdc.ucr.edu for application deadlines and information on how to apply.

Eligibility and Selection
Minimum requirements are a 3.0 cumulative GPA, junior or senior standing during the participating quarter, and completion of at least two upper division courses with a B+ or better. In addition to academic criteria, the selection committee considers the student's seriousness of purpose, maturity and the capacity to adapt to a study-quarter away.

Financial Matters Program participants pay the same UC and campus fees as a quarter at UCR and are responsible for room and board, books, and personal expenses. The only additional cost directly related to the program is round-trip transportation.

Many forms of financial assistance are available to participants. Students who receive state and federal financial aid may use their scholarships, grants and loans to finance their quarter at UCDC. Students who receive financial aid may also be eligible for other awards and scholarships. Other support may also be available; students should consult with the UCDC program staff or the financial aid office for more information.

University Honors

381 Skye Hall
(951) 827-5323
honors@ucr.edu; honors.ucr.edu

University Honors emphasizes scholarship, engagement, and student success and is designed for high-achieving, undergraduate students from all academic disciplines who value intellectual challenges; a curriculum characterized by depth and complexity; and an innovative, diverse, and stimulating learning community comprised of like-minded scholars and based on the three pillars of Promoting Creativity and Innovation, Cultivating a Culture of Contribution, and Celebrating Diversity and Global Citizenship. University Honors seeks to supplement, enhance, and maximize a student's experience at UCR by providing opportunities and resources for students to pursue and achieve their academic, co-curricular, and professional goals. All University Honors students are required to participate in faculty-mentored, undergraduate research, creative activity, or experiential learning, which culminates in a capstone project.

- Incoming first-year students will be invited to apply for admission to University Honors on the basis of their high school grade point average.
- First-year and second-year UCR students will be invited to apply for admission to the second year or third year of University Honors if their cumulative grade point average is 3.50 or above.
- Incoming transfer students will be invited to apply for admission to the third year of University Honors if their transfer grade point average is 3.25 or above.

University Honors provides students with high-impact, educational opportunities; experiential-learning opportunities; co-curricular opportunities; and leadership opportunities. Those opportunities, along with small class settings, close interaction with Honors faculty, counseling from professional staff members, peer-mentoring, and an interdisciplinary curriculum, contribute to the educational experience of University Honors students.



Research Opportunities

Students at UC Riverside have a distinct advantage in the multitude of opportunities available for participating in faculty research programs. Independent participation in such research helps students develop technical skills, explore areas of modern research, and learn how the world of research operates. In addition, working with faculty members gives students the opportunity to interact closely with professors, who, in turn, get to know the students.

To participate in undergraduate research opportunities on campus, students can:

- Check out the college and multicampus research opportunities listed below and visit ucr.edu/research for other opportunities
- Explore the undergraduate research opportunities portal at engage.ucr.edu.
- Examine research-specific websites posted by colleges and departments
- Contact departmental advisors directly
- See the Internship Program under Career Center in the Services for Students section in this catalog. Also, the Capitol Internship program at UC Riverside provides a variety of opportunities for eligible students to earn course credit for substantive internships associated with their academic and career goals. Visit engage.ucr.edu/internship/overview for more information.

College of Humanities, Arts, and Social Sciences

California Center for Native Nations

Director: Michelle Raheja, Ph.D.
2006 Humanities and Social Sciences Building
(951) 827-1799
michelle.raheja@ucr.edu; ccnn.ucr.edu

Provides opportunities for research collaborations with California's native peoples and other Indian tribes that benefit tribal communities and expand scholarly knowledge. As UCR is a neighbor to more than 30 tribes in the surrounding area, the center particularly supports interdisciplinary and culturally sensitive research in collaboration with these communities.

Center for Bibliographical Studies and Research

Director: Brian Geiger, Ph.D., MLS
INTN M1006
(951) 827-5841; fax (951) 827-4120
cbsr.ucr.edu

Supports research and publication in bibliography and the history of the book. It manages five internationally renowned programs.

- **The English Short Title Catalog (ESTC)** records every item published in Great Britain and any British governed territories from the beginning of printing (1473) through the end of the eighteenth century. The catalog is searchable free of cost via the British Library at estc.bl.uk.
- **The California Newspaper Project (CNP)** records surviving issues of all newspapers published in California, freely available for searching at the cnp.ucr.edu.
- **The California Newspaper Microfilm Archive (CNMA)** preserves and stores approximately 100,000 reels of California newspaper microfilm from 1846 to the present. Accessible at cnma.ucr.edu.
- **The California Digital Newspaper Collection (CDNC)** is a text-searchable collection of more than 550,000 pages of digitized California newspapers from 1848 to the present. Accessible at cdnc.ucr.edu.
- **Un Catálogo Colectivo de Impresos Latinoamericanos hasta 1900 (CCILA)** is a comprehensive union catalog of Latin American imprints through 1900. Searchable at ccila.ucr.edu.

Center for Family Studies

Director: Nancy Guerra, Ph.D.
Olmsted Hall, Third Floor
(951) 827-6421
nancy.guerra@ucr.edu

Focuses on significant advances in family theory, research, and application requiring an interdisciplinary perspective and intra- and cross-cultural approaches to family issues. Represents anthropology, education, history, sociology, and psychology.

Center for Ideas and Society

Director: Georgia Warnke, Ph.D., Distinguished Professor of Political Science
College Building South
(951) 827-1555; fax (951) 827-6377;
ideasandsociety.ucr.edu

The Center for Ideas and Society is an interdisciplinary research center dedicated to advancing humanistic studies and creativity at UC Riverside. The Center's fellowships, research workshops, and public events strengthen the intellectual and creative life of the university. The center is committed to disseminating the results of its programs to the Riverside community and beyond.

The center also houses the Institute for the Study of Immigrant Religions and the Mellon Mays Undergraduate Fellowship Program.

Institute for Research on World-Systems

Director: Christopher Chase-Dunn, Ph.D.
4111 Interdisciplinary Building South
(951) 827-2062;
chriscd@ucr.edu; irows.ucr.edu

Organizes collaborative research among social, biological, and physical scientists on long-term, large-scale social change and its ecological, geographical and climatological causes and effects. Research foci include globalization; global inequalities; transnational social movements; urbanization and settlement systems; biotechnology and hegemony; the rise and fall of cities, states, and empires; and climate change.

College of Natural and Agricultural Sciences

AES – Citrus Research Center

agops.ucr.edu/

Founded in 1907, the Agricultural Experiment Station-Citrus Research Center predates the campus by half a century and is the reason that UCR was established in Riverside. The Citrus Experiment Station, as it was first known, was established to provide research-based assistance to the region's flourishing citrus orchards. Today, after 100+ years, UCR's oldest research center continues to generate discoveries that have transformed the way we eat, the way we farm, and the way we treat our natural resources.

Alternative Earths Astrobiology Center

astrobiology.ucr.edu

The Alternative Earths Astrobiology Center is cultivating a "search engine" for life on distant worlds using the best possible template: the billions of years that Earth was teeming with simple life, long before the evolution of animals. Building on $12 million in NASA-funded assets at UC Riverside, this cross-departmental integration of Earth science and astronomy—plus a broader array of on-campus collaborations spawned by this alliance—will position the university as a world leader in the search for habitable worlds and life beyond Earth.

Botanic Gardens

ucrbg@ucr.edu
gardens.ucr.edu

The UCR Botanic Gardens is a living museum with more than 3,500 plant species and thousands of specimens with a focus on plants from Mediterranean climate and arid lands. The Gardens are utilized for teaching, research, and demonstration purposes, as well as enjoyment and appreciation of nature. Numerous engagement activities are offered each year including plant sales, classes and workshops, tours and walks, and an annual fundraiser. The Gardens are supported by an active Friends of the Botanic Gardens membership group and hundreds of volunteers from the campus and community.

California Agriculture and Food Enterprise (CAFÉ)

cafe.ucr.edu

The California Agriculture and Food Enterprise (CAFÉ) builds on UCR's unique history and strengths in interdisciplinary research, facilities and outreach to positively impact the science, policies and practices related to the critical role of food and agriculture to human health and well-being.

Center for Catalysis
catalysis.ucr.edu

The mission of the Center for Catalysis is to tackle new and novel interdisciplinary challenges faced by the field of chemical catalysis in the 21st century. Emphasis is placed on addressing catalytic needs in several areas of current importance in society, including energy storage and generation, environmental remediation, green chemistry and synthesis of specialty chemicals. The center draws from expertise across multiple departments at UCR in undertaking projects in the collaborative, interdisciplinary manner that is prevalent in the field today.

Center for Conservation Biology
ccb.ucr.edu

The Center for Conservation Biology assists in the conservation and restoration of species and ecosystems by facilitating the collection, evaluation, and dissemination of scientific information. The CCB proactively identifies new research priorities in conservation biology and inaugurates new collaborative research programs. It also develops research programs in response to existing needs in conservation biology.

Center for Infectious Disease and Vector Research (CIDVR)
cdvr.ucr.edu

The Center for Infectious Disease and Vector Research is dedicated to obtaining and maintaining an economically and environmentally viable agricultural industry by utilizing the knowledge of insect biology towards the control of insect pests. Researchers collaborate across disciplines to find new approaches to alleviate the medical and economic burden exacted by insect-borne disease.

Center for Integrative Biological Collections (CIBC)
cibc.ucr.edu

The Center for Integrative Biological Collections has a mission to advance research and teaching in biodiversity and to provide support for the management of natural resources by fostering an interdepartmental alliance among UCR's world-class natural history collections. This will be accomplished through integrated and transformative approaches across UCR collections that leverage novel systems in communication, relational databases, datamining, georeferencing, outreach, advocacy and securing enhanced funding.

Center for Interactive Bee Research (CIBER)
CIBER is located at the Department of Entomology. Collectively, the team currently includes 10 faculty and their research groups that conduct collaborative and cross-disciplinary research on pollinator health. Activities connect landscape-level processes with organismal-level interactions and molecular mechanisms to develop tools to identify, quantify, and manage threats to pollinators. The goal is to halt and reverse nationwide declines in pollination services to ensure food security and agricultural sustainability and ecosystem stability. For more information see ciber.ucr.edu

Center for Invasive Species Research (CISR)
cisr.ucr.edu

The Center for Invasive Species Research provides a forward-looking approach to managing invasions by exotic pests and diseases in California. CISR programs on exotic pests involve: (a) risk assessment; (b) early detection; (c) rapid development of control or eradication measures; (d) pest control via biological, microbial, genetic, and chemical practices, and (e) better understanding of patterns and processes facilitating invasions.

Center of Nano-Scale Electronics, Phenomena, and Technology
Director: Chun Ning (Jeanie) Lau, Ph.D.
jeanie.lau@ucr.edu

The Center of Nano-Scale Electronics, Phenomena, and Technology (CONSEPT) focuses on exploring novel electronic, optical, thermal, and mechanical phenomena that emerge in nanoscale systems, and exploiting these phenomena for next-generation devices and systems. Researchers explore novel materials such materials as graphene, carbon nanotubes, magnetic systems, and topological insulators as well as nanomechanical systems and chemical and biological sensing.

Center for Plant Cell Biology (CEPCEB)
cepceb.ucr.edu

The Center for Plant Cell Biology (CPCB) answers significant outstanding questions in plant biology by integrating genomic, bioinformatic, cellular, molecular, biochemical, and genetic approaches. Their goal is to apply the knowledge of how plants respond to their dynamic environment toward manipulation of crop plants safely and efficiently for better and more sustainable production.

Citrus Clonal Protection Program
ccpp.ucr.edu/

The Citrus Clonal Protection Program provides a safe mechanism for the introduction of citrus varieties from any citrus-growing area of the world for the purposes of research, variety improvement, or direct use by the commercial industry. CCPP maintains blocks of trees that serve as the primary source of disease free, true to type budwood of all important fruits and rootsock variets for California's citrus industry and citrus researchers.

The EDGE Institute
edge.ucr.edu/

The Environmental Dynamics and GeoEcology Institute (EDGE) brings together interdisciplinary scientists to answer questions and enable scientific discovery about our changing world while educating students and the public. Using a multidisciplinary approach, the focus of the EDGE Institute is to examine life in a changing environment. In particular, this institute focuses on the fate of carbon, nutrients and water in time and in space.

Institute for Integrative Genome Biology
genomics.ucr.edu

The Institute for Integrative Genome Biology (IIGB) brings together faculty from a wide variety of campus units to participate in this era of rapid genomics-based discovery. Research efforts are focused on the areas of biology, vector biology, mammalian biology, plant biology, bioengineering and public policy issues and are directed toward pioneering solutions towards hunger, disease and environmental sustainability.

Plant Transformation Research Center (PTRC)
ptrc.ucr.edu/services

The University of California at Riverside has a state-of-art facility that can provide you with the infrastructure and expertise for the implementation of molecular biology and genetic engineering technologies for scientific research and teaching purposes. The Center is equipped with two BL-2 greenhouses, a growth room, three tissue culture rooms, a laboratory with all the essential equipment for molecular biology, image analyses, and genetic technologies. Beyond our state of the art facilities, the scientific staff at the Center has extensive experience in working with in vitro plant tissue culture and micropropagation, molecular biology and plant genetic transformation techniques.

The SHINES Center
efrcshines.ucr.edu/

SHINES (Spins and Heat in Nanoscale Electronic Systems) is a new Energy Frontier Research Center (EFRC) funded in 2014 by the US Department of Energy. The SHINES EFRC has three inter-related research themes to address the central question: how do we harvest energy more efficiently from spins and heat on the nanoscale? The boundaries between themes are rather artificial. Many PIs are cross-theme members who work with members in other themes.

Statistical Consulting Collaboratory
Director: Yehua Li, Ph.D.
collaboratory.ucr.edu

Provides statistical consulting services in areas including bioinformatics, agricultural field trials, health studies, ecological studies, entomological studies, sociological studies, marketing studies, industrial experiments, quality and reliability studies, and product and process development studies. Clients include the campus research community and off-campus agencies from all disciplines who use statistics. The collaboratory develops collaborative research relationships as well as research publications. It also provides financial support and consulting experiences to UCR undergraduate and graduate students.

Stem Cell Center
stemcells@ucr.edu; stemcells.ucr.edu

Focuses on understanding the basic mechanisms that control stem cell function and deciphering how the tremendous potential of stem cells can be used to improve human health. Researchers at the center have expertise in many different fields including developmental biology, cancer biology, endocrinology, biomaterials for tissue regeneration, micro/nanotechnologies to control differentiation, neuroscience, toxicology, skeletal tissue repair, endothelial cell differentiation, osteogenesis, differentiation of microglia, brain development, neural crest cell differentiation, and bioengineering.

UCR/City of Hope Comprehensive Cancer Center
The mission of the UCR City of Hope Comprehensive Cancer Center/ Cancer Research & Education (CARE) Partnership is to advance cancer research and drug development and reduce cancer health disparities by: Focusing on cancers that disproportionally impact minority underserved populations, Training a diverse force of cancer research scientists, Enhancing cancer education for our communities, and Improving access for our communities.

UCR Natural Reserves
ucrnrs.ucr.edu/

UCR's Natural Reserves consists of four major and four minor reserves that have research facilities and permanent staff: the Deep Canyon, Granite Mountains, Motte, and James Reserves. Within the nearly 11,400 hectares (28,000 acres) is a broad representation of Southern California's flora, fauna, and major ecosystems. These lands are an invaluable outdoor laboratory for teaching and research, used by scientists throughout the world. In addition, many endangered or diminishing species are protected from the urbanization occurring in Southern California on "habitat islands" preserved within reserve boundaries.

USDA-ARS U.S. Salinity Laboratory
ars.usda.gov/ussl

The only research facility in the nation devoted to the study and amelioration of salinity-related agricultural and environmental problems.

Focal areas include: sensing, mapping, and managing soil salinity; alternative water resources for irrigation; genetics and physiology of plant salt tolerance; and antibiotic resistance.

Division of Undergraduate Education (UE)
Undergraduate Research Journal
The Journal provides a student-edited multi-disciplinary journal that features the very best faculty-mentored undergraduate research and scholarship accomplished on our campus. Professional staff provides targeted writing support for journal submissions.

Undergraduate Research Symposium
The Undergraduate Research & Creative Activities Symposium celebrates undergraduate research and creative activities across all disciplines at UC Riverside, and provides a positive learning experience for presenters and guests.



The Marlan and Rosemary Bourns College of Engineering
College of Engineering–Center for Environmental Research and Technology (CE-CERT)
Director: Matthew Barth, Ph.D.
1084 Columbia Avenue
Riverside, CA 92507
(951) 781-5791; fax (951) 781-5790
info@cert.ucr.edu; cert.ucr.edu

A model for partnerships among industry, government, and the academic community, CE-CERT is one of California's premier facilities for research into air quality, transportation, and energy efficiency. The research mission includes transportation systems, emissions and fuels, renewable energy, environmental modeling and policy, and atmospheric processes.

Center for Nanoscale Science and Engineering (CNSE) Nanofabrication Facility
Director: Dr. Alexander A. Balandin, Distinguished Professor
(951) 827-3058; fax (951) 827-6262
balandin@ece.ucr.edu; cnse.ucr.edu

The Center for Nanoscale Science and Engineering (CNSE) was established by the Bourns College of Engineering (BCOE) and the College of Natural and Agricultural Sciences (CNAS), and maintains strong ties to the Materials Science and Engineering Program, the Division of Biomedical Sciences, and the UCR Medical School. CNSE brings together researchers from engineering, physics, chemistry, materials science, and medicine, and fosters interdisciplinary research and cooperation by providing a state-of-the-art environment for graduate students, postdoctoral researchers and faculty. Its Nanofabrication Cleanroom Facility supports world-class research and graduate student training in all areas of nanotechnology. CNSE supports externally funded multi-PI projects and research centers at UCR, and facilitates cooperation with the high-tech industry in the region and the State. The research thrusts supported by CNSE include next-generation electronics, spintronics, low-dimensional materials and devices, and nano-medicine, as well as emerging interdisciplinary fields such as heterogeneously integrated devices and circuits, sensor technologies, biomedical, renewable energy, and environmental engineering.

Center on Robotics and Intelligent Systems (CRIS)
Director: Amit Roy Chowdhury, Ph.D.
Associate Director: Fabio Pasqualetti, Ph.D.
Winston Chung Hall, Room 216
(951) 827-7886; fax: (951) 827-2425
amitrc@ece.ucr.edu; cris.ucr.edu

The Center for Research in Intelligent Systems conducts cutting-edge research on the foundations and applications of intelligent and autonomous systems, including robotics, computer vision, controls, machine learning, real-time systems, and biomedical systems, among others. The center brings together faculty from across UCR and outside in developing cross-disciplinary and highly impactful projects, while fostering industrial collaborations and training the next generation of researchers.

Data Science Center
Director: Vassilis Tsotras, Ph.D.
Multidisciplinary Research Building
(951) 827-2888; fax: (951) 827-4643
tsotras@cs.ucr.edu; datascience.ucr.edu

The purpose of the Data Science Center (DiSCoveR) is to establish UCR as a prominent player in data science related research. It does so by promoting collaborations between the faculty in the data science group with researchers across campus. In addition to its research activities, the Center runs a weekly Data Science Seminar where speakers describe research challenges they face dealing with data. Education is also a major focus of the center.

Winston Chung Global Energy Center (WCGEC)

Director: Reza Abbaschian, Ph.D., Distinguished Professor
Associate Director: Hamed Mohsenian-Rad, Ph.D.
Main Campus: Bourns Hall, A203
Off Campus: 1084 Columbia Ave, Riverside, CA 92507
(951) 827-6452; fax: (951) 827-5696
wcgecinfo@wcgec.ucr.edu; wcgec.ucr.edu

The Winston Chung Global Energy Center (WCGEC) focuses on solutions for today's energy storage demands, while developing far-sighted energy storage research and energy-use strategies for tomorrow's applications. Bridging the gap between industry and academia, the center's goal is to contribute to the economic, social and environmental health of communities around the world. The activities of this innovative center include fostering a premier academic environment of research and discovery in sustainable energy, with a focus on storage issues; educating a diverse and distinguished engineering workforce that is dedicated to addressing global energy needs; offering tools and training that will increase the capacity of public and private planners, architects, engineers, utilities and developers to design and build energy-efficient community projects; reaching out to global organizations and businesses as a partner in fostering clean energy storage solutions; and inspiring leadership and community action to address energy storage issues in California and the world.

UCR Center for Advanced Neuroengineering (UCR CAN)

Director: Xiaoping Xu, Ph.D.
MRI Building
(951) 827-7535
can@ucr.edu; can.ucr.edu

The Center for Advanced Neuroimaging (CAN) is an interdisciplinary research center bringing together faculty from bioengineering and other engineering disciplines, psychology, and medicine. The center houses a 3 Tesla Siemens Prisma Magnetic Resonance Imaging (MRI) scanner and a MRI compatible 64 channel electroencephalogram (EEG), allowing CAN researchers to probe brain structure and function. The ultimate goal of CAN is to improve our understanding of normal brain function and dysfunction. Ongoing research includes (but is not limited to) studies examining brain function/structure in normal subjects and brain dysfunction in autism spectrum disorders, Parkinson's disease, stroke, and traumatic brain injury.

Center for Industrial Biotechnology (CIB)

Director: Ian Wheeldon, Ph.D.
Bourns Hall
(951) 827-2471; fax: (951) 827-5696
ian.wheeldon@ucr.edu; cib.ucr.edu

The UCR Center for Industrial Biotechnology (CIB) seeks to co-train a new generation of engineers and life scientists to collaborate in entrepreneurial and multidisciplinary settings, employing biotechnology in the manufacture of chemicals, biofuels, and healthcare products and in agriculture and crop production. With a focus on microbial and plant synthetic biology, the Center's research activities will translate the rapid advances in engineering and life sciences into industrially useful products and processes that address important societal needs. The Center pursues innovation in four areas of application: agriculture, the production of industrial chemicals, biofuels and healthcare. The training of students, development of processes, products, and "toolboxes" for manipulation, control and optimization of biological systems will result in discoveries and innovations that are ready for commercialization. The development of plant synthetic biology will provide new routes to monitor and regulate plant stress responses, providing new approaches to enhance crop productivity.

UCR Center for Research and Education in Cyber Security and Privacy (CRESP)

Director: Heng Yin, Ph.D.
Winston Chung Hall
(951) 827-6437
heng@cs.ucr.edu; cresp.cs.ucr.edu

The mission of the Center for Research and Education in Cyber Security and Privacy (CRESP) is to bring together academic researchers, students, and industrial partners to develop innovative and disruptive technologies for the prevention, mitigation, detection, and analysis of attacks in cyberspace. We seek to be a premier center for cybersecurity, designing novel approaches to building secure systems and enabling them to detect and tolerate attacks. We also seek to prepare talented engineers and researchers with the technical and problem-solving skills in this area of national need.

School of Education

The School of Education's website for research specific centers, programs, and labs is: education.ucr.edu/research.

Center for Athletes' Rights and Equity (CARE)

The UCR Center for Athletes' Rights and Equity (CARE) is an interdisciplinary engaged research center focused on the rights and collective well-being of athletes across all levels of competition. CARE's mission is to address structural inequalities in sport and to create better, more equitable experiences and outcomes for amateur, collegiate, and professional athletes.

CARE prioritizes research with an overarching goal to inspire, engage, educate, and empower sport and education leaders and athletes themselves—and to holistically prepare athletes for sustainable professional careers beyond sport. With our innovative and cutting-edge research, educational programs, learning sessions, community outreach, and diverse partnerships, CARE serves as a unique and leading resource to advance knowledge and contribute to a more vibrant, inclusive, and equitable future for athletes.

Eddie.Comeaux@ucr.edu
athletescare.ucr.edu

Institute for Teachers of Color Committed to Racial Justice (ITOC)

Dr. Rita Kohli is co-founder and co-director of ITOC. ITOC serves educators with who demonstrate capacity for racial justice leadership in public schools. Using critical race frameworks, ITOC is intended as a community building, professional development space for teachers of Color to explore the racial climate of their schools and its impact on their students, communities, and themselves, receive leadership training to navigate these realities, and strategize how to create racially transformative classrooms and schools.

Rita.Kohli@ucr.edu
http://www.instituteforteachersofcolor.org

Social Cognitive Developmental Neuroscience Lab

Dr. Katherine Meltzoff oversees the Social Cognitive Developmental Neuroscience Lab. The lab is part of the School of Education at the University of California, Riverside. The lab uses neuroscience to better understand social and cognitive processes in children and adults.

https://scdnlab.ucr.edu/

School Service Provision Research Collaborative

The School Service Provision Research Collaborative (SSPRC) is dedicated to conducting high-quality, applied research to effect enduring improvements to universal and targeted academic, behavioral, and social-emotional supports in schools as well as the processes and procedures used in their implementation. The work of the SSPRC is grounded in a prevention, early intervention, and multi-tiered problem-solving approach to service delivery. SSPRC work is heavily influenced by implementation science, consultation, and Multi-tiered Systems of Educator Support (MTSES) principles. This work is driven by the understanding that improving factors influencing school service provision can impact the short- and long-term outcomes for students in school and beyond and may be even more impactful for historically undeserved, marginalized groups.

https://ssprc.org/

STEM Teaching and Learning Lab

The Science Technology Engineering and Mathematics (STEM) Teaching and Learning Lab is directed by Dr. Kinnari Atit. In the lab, research is conducted to better understand how to improve teaching and learning in the STEM fields.

Kinnari.Atit@ucr.edu
stemteachlearn.ucr.edu

SEARCH Family Autism Resource Center

SEARCH is the acronym for Support, Education, Advocacy, Resources, Community, and Hope. The center is the University of California's first family autism resource center focused exclusively on family needs, such as educational access. Housed in the UCR School of Education, the mission of SEARCH is to reduce the amount of stress they experience in attempting to learn about autism and access appropriate programs and treatments. While simultaneously training the next generation of autism researchers and educators, SEARCH provides assessments in both Spanish and English, and students learn procedures used both in clinic and schools.

(951) 827-3849
searchcenter@ucr.edu; searchcenter.ucr.edu

Civic Engagement Research Group (CERG)

CERG's mission is to provide an evidence base that informs the design of policies and programs that promote the development of citizens for an effective, just, and humane democratic society. We conduct quantitative and qualitative research focused on understanding:

- The nature of youth civic engagement
- The impact of civic learning opportunities and digital media participation on young people's civic capacities and commitments
- The quantity, quality, and equality of civic opportunities and outcomes in public schools and other contexts

The goal is to monitor trends, frame priorities, and develop an evidence base regarding effective civic education practices and policies.

Joseph.Kahne@ucr.edu; www.civicsurvey.org

School of Medicine

Center for Glial-Neuronal Interactions: Innovative Collaborations Applied to Problems of Brain Health and Disease

Director: Monica J. Carson, Ph.D.
monica.carson@ucr.edu; cgni.ucr.edu

The Center for Glial-Neuronal Interactions (CGNI) in UCR's School of Medicine is dedicated to facilitating innovative collaborations between neuro- and glial-centric researchers as well as with researchers from outside the field of neuroscience. The ultimate goal is to understand central nervous system function at a molecular level with the goal of identifying risk factors and therapeutic targets of intervention for cognitive, neurodevelopmental and neurodegenerative central nervous system diseases. Ongoing research includes programs on Alzheimer's disease, autism spectrum disorders, cognitive disorders, epilepsy, glioblastoma, infections of the brain, multiple sclerosis, neuroinflammatory disorders, phantom limb syndrome, stroke, substance abuse and traumatic brain injury.

Center for Healthy Communities

Director: Michelle C. Burroughs, M.P.H.
michelle.burroughs@medsch.ucr.edu
healthycommunities.ucr.edu

The Center for Healthy Communities (CHC) collaborates with community partners to implement innovative community-based participatory research aimed at promoting health equity in Inland Southern California, particularly in Riverside and San Bernardino counties. CHC focuses on improving the health of culturally and economically diverse populations, especially those who are medically underserved, by building connections with community groups and interdisciplinary health field faculty. The center fosters partnerships between UCR faculty, community-based organizations, grassroots community leaders, and scholars from other institutions. Although housed in the UCR School of Medicine, CHC aims to benefit all UCR faculty programs, community partners, and the Inland Southern California communities.

Center for Molecular and Translational Medicine

Director: Maurizio Pellecchia, Ph.D.
maurizio.pellecchia@ucr.edu
molmed.ucr.edu

This campus-wide initiative provides a forum to accelerate and enhance collaboration among faculty whose research is devoted to the translation of basic sciences into potential therapeutics, medical devices or diagnostics. With this initiative, UC Riverside and the School of Medicine commit to devote resources to assist in the development of novel treatments. The translation of basic laboratory discoveries into potential therapies, however, requires a multitude of efforts and expertise that no individual laboratory or funding source can, in isolation, fulfill. Potentially effective therapeutic strategies often never reach the patients due to the lack proper support necessary to channel basic laboratory pre-clinical studies through the complex and rigorous testing of experimental therapeutics. It is envisioned that the Center would either directly support or catalyze funding initiatives to advance the most promising innovative targeting approaches and agents into early stage clinical experimental therapeutics, therefore actively assisting in the first steps toward their development.

Center for RNA Biology and Medicine

Director: Sika Zheng, Ph.D.
Sika.Zheng@medsch.ucr.edu
rna.ucr.edu

The Center for RNA Biology and Medicine at the University of California, Riverside is a multi-disciplinary research center that builds upon UCR's deep and unique strengths in RNA research and facilitates interdisciplinary interactions to promote fundamental science discoveries and to address RNA-centric industrial, biomedical, and therapeutic needs.

University of California Riverside Center for Cannabinoid Research (UCRCCR)

Director: Nicholas V. DiPatrizio, Ph.D.
ndipatri@medsch.ucr.edu, cannabinoid.ucr.edu

The University of California Riverside Center for Cannabinoid Research (UCRCCR) is comprised of diverse scientists, clinicians, and trainees with common goals of understanding roles for the cannabinoid system in health and disease. Moreover, given the widespread legalization of cannabis for both recreational and medicinal purposes throughout the United States and the world, it is critical that we identify the impact that cannabis use has on health, and to do so in an unbiased manner unaffected by dogmas and stigmas that have plagued cannabinoid research for decades. UCRCCR is uniquely positioned to achieve success in this area due to its promotion of a holistic approach to cannabinoid research that includes elucidating the biology of the endogenous cannabinoid system in the body, and the effects that cannabis use has on these systems. This foundation will support collaborative efforts and the training and development of our future scientists and clinicians with interests in cannabinoid and related research.

School of Public Policy

Center for Community Solutions

Faculty Director: Qingfang Wang, Ph.D.
Executive Director: Justine Ross, Ph.D.
communitysolutions.ucr.edu

Answers challenging public policy questions that are of the utmost relevance and importance to communities in Inland Southern California. We believe in the promise of our region and aim to contribute to its growth and prosperity by helping to ground public decisions in credible research, fostering knowledge exchange across diverse constituencies, and developing the next generation of policy leaders.

The Center for Community Solutions strives to embody the School of Public Policy's motto — solutions for the region, solutions for the world — by providing research services and resources to improve the lives of residents in our local region, while cultivating generalizable knowledge that can improve public policy in communities throughout the world.

Center for Geospatial Sciences

Director: Tony Grubesic, Ph.D.
spatial.ucr.edu

The Center for Geospatial Sciences promotes transdisciplinary approaches to problem solving, leveraging spatial analytics, geocomputation and geoinformatics techniques for enhancing decision making and improving public policy. CGS is structured to cross traditional academic boundaries, interface with the community and engage both the public and private sectors in promoting innovation in three key domains:

1. Pioneer new methods and analytical techniques for computationally intensive geospatial planning and policy problems, including spatio-temporal prediction, context-aware computing and sensing, and geovisualization – all through the use of open-source software tools when possible.
2. Develop state-of-the-art capabilities for the collection, fusion and curation of geospatial data produced by next-generation sensors such as LIDAR, unmanned aerial vehicles (UAVs) and mobile devices.
3. Educate the next generation of computational social, planning, policy and environmental scientists in STEM fields through cutting edge coursework that emphasizes spatio-temporal reasoning, visual thinking and policy-relevant research.

Presley Center of Crime and Justice Studies

Director: Sharon Oselin, Ph.D.
Associate Director: Justine Ross, Ph.D.
External Relations Director: Sergio Diaz
External Relations Director: Michael Ramos
presleycenter.ucr.edu

Conducts empirical research that informs evidence-based practice on issues related to crime and the criminal justice system. The center maintains an active research agenda in the areas of re-entry, recidivism, and justice and collaborates with regional and state agencies on projects that contribute to improved policy and practice.

Multicampus Research

Agricultural Experiment Station – Citrus Research Center

http://cnas.ucr.edu/about/aes/aes.html

A branch of the University of California's statewide Agricultural Experiment Station, the nation's largest land-grant experiment station and the research arm of the University of California's Division of Agricultural and Natural Resources headquartered in Davis. Conducts research in plants, pests and disease, and natural resource sciences; through Cooperative Extension, provides leadership in the dissemination and application of research-based knowledge in agricultural and environmental science to the people of California. Through educational programs and research opportunities, prepares tomorrow's leaders in agricultural and environmental science.

Ubiquitous Communication by Light (UC-Light)

Director: Albert Wang, Ph.D.
234 Winston Chung Hall
(951) 827-2986
aw@ece.ucr.edu; uclight.ucr.edu

The mission of the UC-Light center is to enable wireless communications by embedding signals into the light emitted by next-generation LEDs in systems for illumination, traffic control, advertising, and other purposes. Funded from the Multicampus Research Program and Initiatives (MRPI) competition within the University of California (UC) system and under assistance of Founding Director, Zhengyuan Xu, the UC-Light center is situated in a modern engineering complex at UC Riverside. The Center research comprehensively and uniquely covers three thrust areas pertinent to LED lighting – efficient lighting, communication, and navigation – with significant potential for creating new technological innovations, economic activity, and energy savings benefits. Developed protocols and sub-systems are further integrated into modern architecture design and ASIC chips to ultimately deliver deployable systems and transfer technologies. The iterative experimentation, modeling, design, validation, and multi-dimensional feedback constitute a unified coherent framework to ensure Center success.

The Center closely interacts with a large community, from communication to lighting industries, standardization organizations, peer researchers, funding agencies, and general public.

Cooperative Extension

http://cnas.ucr.edu/about/aes/ces.html

Cooperative Extension specialists headquartered at UCR oversee research programs that provide technologies and scientific information to aid the region's residents and help coordinate the activities of farm, family and consumer services advisors based in more than 50 county offices. Programs include sustainable agriculture, pest and disease management, irrigation, water quality, urban horticulture, and natural resources management.

Natural Reserve System

Director: Kimberly Hammond, Ph.D.
Assistant Director: Richard Redak, Ph,D.
kimberly.hammond@ucr.edu; richard.redak@ucr.edu
ucnrs.org

The University of California Natural Reserve System maintains for teaching and research a system of reserves encompassing the diversity of California's natural terrain. Any qualified individual or institution may use the reserves under the direction and with the approval of the university. UCR administers 8 of the approximately 40 reserves systemwide.

Philip L. Boyd Deep Canyon Desert Research Center encompasses 6,122 acres of desert habitat around Deep Canyon, near Palm Desert. An air-conditioned field station with living quarters and laboratories is located near the mouth of Deep Canyon. A primitive campground and 2-square-mile teaching area is available for class use. ucnrs.org

Box Springs Reserve consists of 160 acres near the top of Box Springs Mountains and includes a coastal sage scrub. No laboratory facilities are present on the property, because of the proximity of such facilities on the UCR campus. This reserve has been used for field class laboratories and student research projects, but other research projects can be conducted at this site. ucnrs.org

James San Jacinto Mountains Reserve near Idyllwild is approximately 30 acres, surrounded on all sides by relatively undisturbed national forest land. Nearby there are 60 miles of hiking trails with access to thousands of acres of mid- and high-elevation wilderness, from nearby Lake Fulmor to the summit of Black Mountain, at 7,800 feet. The reserve is equipped for over seventy researchers and classes of student in four fully-equipped cabins. The reserve can also accommodate visitors in a stand-alone classroom. james. ucnrs.org

Oasis de los Osos Reserve is a satellite reserve of the James San Jacinto Mountains Reserve and is located near Snow Creek at the northern base of Mount San Jacinto. This property consists of 160 acres of rocky desert slopes and a dry alluvial fan. It also contains a perennial stream (Lamb Creek) with some waterfalls. A riparian woodland grows along this stream. A semi-desert scrub plant community occurs on the dry slopes and alluvial fan and along the washes. No facilities are available at this site. https://james.ucnrs.org/oasis-de-los-osos/

Jack and Marilyn Sweeney Granite Mountains Desert Research Center Encompasses 9,000 acres embedded in the 1.8 million-acre Mojave National Preserve in eastern San Bernardino County. Rising to near 7,000 ft, this rugged and scenic site offers exceptional local and regional biotic diversity, ranging from species typical of the Mojave, Sonoran and Great Basin Deserts, and relictual taxa affiliated with the Colorado Plateau and Transverse Ranges. The Kenneth Norris Teaching Area offers both indoor and camping facilities for class use, and the Allanson complex in Granite Cove includes a state-of-the-art research laboratory, conference room, and lodging for up to 20 researchers. granite. ucnrs.org

Sacramento Mountains Reserve is a satellite of the Sweeney Granite Mountains Desear Reserve Center and contains approximately 590 acres of Mojave Desert habitat at the Sonoran Desert transition. It is located about 18 miles west of Needles, CA, in San Bernardino County. The reserve contains ten species of cacti, including one of the best displays of Bigelow Cholla (Cylindropuntia bigelovii) in California. It also boasts the northwesternmost occurrence of Ocotillo (Fouquieria splendens). No laboratory facilities or living quarters are on this site, but lodging is available just offsite or at the nearby Granite Mountains Desert Research Center, for anyone wishing to use the reserve for teaching or research. granite. ucnrs.org

Motte Rimrock Reserve consists of approximately 715 acres at the northwestern corner of Perris, about 15 miles from campus. The vegetation is principally coastal sage scrub and grassland with riparian corridors in the canyons. This land is of particular biological interest for this region because it contains several species of conservation interest. Indian pictographs and a former Indian village site also are on this reserve. A headquarters building contains sleeping facilities for reserve users. ucnrs.org

Emerson Oaks Reserve is located 5 miles east of Temecula and 1 mile south of Highway 79. This 255-acre site contains coastal sage scrub on the lower hills, and oak woodland. ucnrs.org

UC Institute for Mexico and the United States (UC MEXUS)

Interim Director: Stefano Bertozzi, Ph.D.
3324 Olmsted Hall
(951) 827-3519; fax (951) 827-3856;
ucmexus@ucr.edu; ucmexus.ucr.edu

Since its establishment in 1980, the University of California Institute for Mexico and the United States (UC MEXUS) has maintained the primary mission of developing and sustaining a coordinated, university-wide approach to Mexico-related studies. **The institute's broad objectives are:**

- to increase the quantity, visibility, and effectiveness of Mexico-United States projects in the university;
- to strengthen and develop research, exchange programs, and teaching;
- to support and coordinate interdisciplinary and inter-campus projects;
- to encourage and enable collaborative approaches by UC and Mexican scholars to the issues which affect both nations;
- to act as a source of information about university-sponsored United States-Mexico activities;
- to develop new sources for support of research and instructional programs;
- and to promote a better understanding between the two countries.

Within this broad definition, UC MEXUS seeks to identify, encourage, secure financial support for, and publicize programs which promise to contribute substantially to scholarship, to enhance university instruction—particularly in graduate and professional areas—to improve binational understanding, and to make positive contributions to society in both Mexico and the United States. The Institute has been located at the UC Riverside campus since 1984.

Services for Students

All programs and services offered are open to everyone, in accordance with state and federal law and the University of California's nondiscrimination policies.

Academic Resource Center

Director: Rena M. Roberts, Ed.D.
380 Skye Hall, Room 156
(951) 827-3721
arc.ucr.edu

ARC provides academic support to all enrolled undergraduate students at UCR with the goal of helping students succeed and excel academically. Programs and services are at no additional cost. unless otherwise noted. See the ARC website for hours of operation and service locations.

In addition to the programs and services listed below, the ARC offers student employment and leadership development opportunities for undergraduate students as peer educators: SI leaders, tutors, peer mentors, math advisory exam and administrative support assistants. Highlander Early Start Academy (HESA) also offers TA positions for graduate students.

Associated Students (ASUCR) (Undergraduate Student Government)

202 Highlander Union Building (HUB)
(951) 827-3621; asucr.ucr.edu

ASUCR is the undergraduate student government consisting of up to 19 elected senators representing the six academic colleges: Engineering (2), Natural and Agricultural Sciences (5), Humanities, Arts and Social Sciences (9), Public Policy (1), School of Education (1), and School of Business (1). Also elected by the undergraduate students are the Executive Branch which have specific focus areas in advocacy, engagement, and governance. The executive cabinet consists of the President, Executive Vice President, Vice President of Diversity, Equity and Inclusion, Vice President of External Affairs, Vice President of Finance, Vice President of Campus Internal Affairs, Vice President of Marketing and Promotions, and Vice President of Sustainability. Additionally, there are 7 directors that make up the extended cabinet and consists of the Personnel Director, the Transfer Student Director, the Non-Traditional Student Director, the First-Time College Student Director, and the International Student Director.ASUCR is supported by the ASUCR fee, $12.50 per quarter: $2.00 funds clubs and organizations activities and events, and $10.50 funds student programs, advocacy efforts and the operating costs of ASUCR. ASUCR is a member of the UC Student Association (UCSA) for system-wide and statewide representation. It appoints undergraduates to several committees that play a role in campus governance, including the Highlander Union Governing Board, the Student Services Fee Advisory Committee, the Campus Finance Committee, and various subcommittees of the Academic Senate.

Associated Students Program Board (ASPB)

111 Highlander Union Building (HUB)
(951) 827-ASPB (2772); fax (951) 827-2144
aspb@ucr.edu; aspb.ucr.edu

The Associated Student Programming Board is student-run and plays a critical role in providing student programming and entertainment for UCR's campus community. From annual events such as Highlander Welcome, Block Party, the Wednesday Nooner Series, Homecoming, and Spring Splash, to special programs such as comedy shows, spoken word, unique experiences and early film premieres.

Athletics and Recreation

Highlander Athletics

Director: Wesley Mallette
120 Physical Education Building
(951) 827-5432; gohighlanders.com

A member of the National Collegiate Athletics Association (NCAA) Division I and the Big West Conference, UCR competes in 17 sports: eight for men — baseball, basketball, cross country, golf, soccer, tennis, and indoor and outdoor track and field — and nine for women — basketball, cross country, golf, soccer, softball, tennis, indoor and outdoor track and field, and volleyball. All UCR undergraduate students are admitted free to any regular season, home athletics event by presenting their UCR ID card at the Athletics Ticket Booth. For sport schedules and other information regarding Highlander Athletics, gohighlanders.com.

Recreation

Director: Lindy Fenex, Ph.D.
Student Recreation Center
Linden Street (northwest side of campus)
(951) 827-5738; recreation.ucr.edu

All UCR students are automatically members of the Student Recreation Center (SRC), a 155,000 square foot state-of-the-art facility for exercise, sports activities, and general recreational use. The SRC includes a large swimming pool and spa, tennis courts, an indoor running track, a gym with multiple courts, classroom kitchen, outdoor gear rental shop, cardio and weight space, an indoor climbing wall and boulder. Download the UCRSRC mobile app from http://go.ucr.edu/src to gain access to your premiere fitness center today!

Activity Classes offers fee based activity classes such as a variety of dance and martial arts classes. We also offer tennis, pickleball and CPR instruction.

Aquatics offers a large swimming pool, with lap/recreational swimming, lessons, workouts, and events.

Competitive Sports include intramural sports consisting of men's, women's and coed intramural leagues in basketball, volleyball, flag football, soccer, and racquetball. Also, the club sports program offers men's and women's rugby, soccer, volleyball, and dance sport competition clubs.

Cooking Well offers UCR students the ability to learn new skills and gain confidence in the kitchen by exposing them to fresh ingredients with fun, affordable, simple recipes/techniques.

FitWell Access group fitness classes, such as Zumba, yoga, cardio kickboxing, cycling and so much more! Workout in your 21,000-square-foot fitness center at no additional cost.

Open Recreation offers access to our weight room, cardio area, basketball, racquetball, badminton, volleyball and squash courts at your own leisure.

Outdoor Excursions (OE) offers hiking, rock climbing, scuba, snowboarding, kayaking, and many other activities. The OE rental shop offers tents, sleeping bags, snowboards at a discounted price.

Ropes can challenge you with climbing activities! Experience the Challenge Course, our outdoor ropes and team building course located behind the SRC. Also take part in competitions, clinics and open climbing at The Rock (our indoor rock wall and boulder).

Youth Activities offers children the opportunity to develop soft skills and take part in fun activities such as archery, soccer, crafts and more. Great for siblings and relatives from ages 5 to 15 years old.

Visit our website for additional online classes, workshops and virtual offerings.

Basic Needs

Basic Needs Senior Manager: Sesley Lewis
127 Highlander Union Building
(951) 827-6276
sesley.lewis@ucr.edu

The Basic Needs department focuses on providing resources to students experiencing food and/or housing insecurity, or students who need support during a financial crisis. Our resources include the R'Pantry which provides currently enrolled students with food resources, hygiene products, and child care items. Additionally, we offer application assistance for the CalFresh food aid enrollment process, and additional support through our Economic Crisis Response Team.

For more information on the resources available and how to access these resources please visit us at basicneeds.ucr.edu.

Black Student Success

Student Services Building #2106
(951) 827-1822
blackstudentsuccess.ucr.edu

Black Student Success engages with Black Scholars (and those scholars with an interest in Black culture and history) at the undergraduate and graduate level to ensure that scholars are accessing the full breadth of academic resources, professional development resources, social-cultural development resources, and wellness resources UC Riverside has to offer. They advocate for Black Scholars (and those scholars with an interest in Black culture and history) on all matters pertaining to their overall wellbeing and comprehensive college experience. Additionally, they collaborate with key UC Riverside staff and faculty to create and facilitate programming practices, and opportunities that utilize the Anti-Deficit Framework to ensure that the needs and aspirations of Black Scholars (and those scholars with an interest in Black culture and history) are both heard and addressed.

All programs and services offered are open to everyone, in accordance with state and federal law and the University of California's nondiscrimination policies.

Campus Media

The Highlander (Student Newspaper)

101 Highlander Union Building (HUB)
Newsroom (951) 827-3617; Business/Advertising (951) 827-5039
highlandernews.org

The Highlander provides quality reporting and insightful editorials on campus-related issues, Riverside community-based issues, and coverage of UCR cultural and sports events. The paper is published every Tuesday during the academic year. It receives funding from advertising and a student fee. Students with a desire to write and a passion for journalism or graphic design as well as advertising can work for *The Highlander*. The Highlander Newspaper office is located in HUB 101 at UC Riverside.

You can contact the front desk at (951) 827-3617 from 9 a.m. to 5 p.m., Monday to Friday.

KUCR (Radio Station of UC Riverside)

(88.3 FM in the Riverside area, kucr.org online)

Director: Louis Vandenberg
691 Linden Street
(951) 827-3737
kucr.org (info, show schedules, and live on-line web-streaming)

KUCR, the radio station of UC Riverside, has been a vital and active element of the campus (and Inland Empire) since 1965. KUCR is real college radio in the classic mode, licensed by the FCC and broadcasting to the campus and greater Riverside community on air and on-line. KUCR music programs are deep and diverse, presenting a wide variety of genres, from the most current indie rock, electronic and hip-hop, to world, classical music, and jazz. The station, which is nationally recognized and is one of the largest producers of podcasts in the UC system, features an excellent award-winning set of public affairs, news, and sports programs. KUCR also presents live concerts, public affairs lectures, debates, a long-running comedy series and panel discussions. In addition, the station does numerous in-person dj events on campus and in the community throughout the year. KUCR also expertly produces media for other university departments and entities, such as the BBC, Canadian Broadcasting, NPR, Deutsche Welle, Australian Broadcasting and others. The station has developed a burgeoning online complementary presence, with numerous YouTube interview and performance videos, Facebook, Instagram, Twitter, et al. KUCR has a small core professional staff, with faculty participation, but features students at all levels, in management, programming, on-air dj's, sportscasters, producers, staffers and more. KUCR embodies the university's respect for diverse points of view, ethnic backgrounds, political beliefs, attitudes, and sexual orientations. KUCR doesn't duplicate the mainstream, but provides "alternative" programming not normally heard on commercial radio. The station broadcasts 24 hours a day, 365 days a year, on the air, via web-streaming, and via a free KUCR iPhone app (Android via the TuneIn app) for mobile devices.

Card Services

Director: Robert J. Miller III; (951) 827-9034
Assistant Director: Erica Henderson; (951) 827-1210
Customer Service Coordinator: Evan McGuffin; (951) 827-2274
Open Monday through Friday, 9 a.m. – 4 p.m.
Located at the Highlander Service Station
(adjacent to the UCR Bookstore)
(951) UCR-CARD (827-2273); ucrcard.ucr.edu

Multi-Purpose Access Card
Your UCR ID (R'Card) is the official campus ID, connecting you to essential campus services and activities. You use it for class attendance, as a ticket for UCR home athletic games and major social events. Your R'Card also provides access to UCR libraries, Residence Halls, Dining Plans, laptop rentals, labs, and printing kiosks. Some campus resources require an R'Card to access services.

Use the R'Card as a Payment/Debit Card
By adding Bear Bucks, Dining Dollars, or Meal Plans your R'Card can be used for payment at nearly all campus locations. Venues that accept the R'Card include: The UCR Bookstore, campus restaurants and convenience stores, vending machines, WEPA kiosks and library printing solutions for 3D and large format posters.

Bear Bucks
Bear Bucks are accepted almost everywhere on campus and provide a secure payment method. To add funds to Bear Bucks, log in to your "My Card Account" at ucrcard.ucr.edu with your CAS credentials. Family members can add to their student's Bear Bucks account at the "Make a Guest Deposit" link on our website. There's never a fee to add Bear Bucks, and deposited funds never expire.

Dining Dollars
If you have a Dining Plan that includes Dining Dollars, they are automatically added to your R'Card account. Dining Dollars roll over from quarter to quarter, but expire at the end of each academic year.

Campus Advocacy, Resources & Education (CARE)

HUB 381
(951) 827-6225
advocate@ucr.edu
care.ucr.edu

CARE is an advocacy and prevention equity center committed to ending sexual and relationship violence at UC Riverside by providing trauma-informed primary prevention, direct advocacy and resources related to experiences of sexual assault, relationship violence and stalking to students, staff, faculty and UCR affiliates. CARE approaches survivor advocacy and the development of violence prevention through intersectional, empowerment-based and trauma-informed practices. Inclusivity, social justice and collaboration through community are core values of the department and it's commitment to student and staff success at UCR.

Confidential Survivor Advocacy
Traumatic incidents of sexual and relationship violence can impact the holistic wellbeing of students, staff, and faculty. The aftermath can include having to navigate healing support, emotional & psychological symptoms, safety, housing and academic challenges, and law enforcement/ Title IX reporting options. CARE Advocates are campus-based, confidential & privileged sexual assault/domestic violence counselor advocates dedicated to empowering students, staff and faculty navigating such experiences. CARE advocates can help facilitate:

- Holistic healing opportunities for individuals and communities that have experienced violence
- Housing and academic accommodations
- Safety planning that includes assistance with restraining orders and other protective measures
- Coordination and accompaniments of SART examinations, investigative interviews and court proceedings
- Referrals to on and off campus resources
- Exploring reporting options with Title IX and/or law enforcement
- Ongoing opportunities to build community and support for survivors on campus

Violence Prevention
CARE works with campus departments, student organizations, peer educators, and the general campus community to engage in developing healthy climates, workplaces, and learning environments free from harassment and violence. This includes working to develop ongoing trauma-informed training with staff/faculty; peer-led violence prevention workshops that include bystander intervention, consent, healthy relationships, social norms; programmatic initiatives that seek to work with particular communities on campus including Athletics, Fraternity and Sorority Involvement Center, Ethnic & Gender Programs, International Students and much more.

Career Center

Director: Sean H. Gil, M.P.A.
Career Center Plaza
(in front of the University Lecture Hall and Skye Hall Building)
(951) 827-3631; careers.ucr.edu

The UCR Career Center empowers students to make informed decisions about their majors, career paths, and future goals. With 14 career professionals and 20+ trained student staff, we provide personalized advising, career assessments, and year-round workshops. Our comprehensive online tools are available 24/7 to support students at every stage.

Student Employment. Thousands of part-time, full-time, remote, and summer job opportunities are available through Handshake (ucr.joinhandshake.com) our online job board. Many on-campus jobs offer flexible hours and valuable work experience during the academic year.

Career Development & Employer Engagement. Students receive guidance on resumes, interviews, and job search strategies through one-on-one appointments or drop-ins, both in person and online. In 2024-2025, more than 200 employers visited campus, including Sorenson Engineering, EY LLP, Southern California Edison, Teach for America, County of Riverside, and Enterprise Mobility.

Professional Appearance Support. The R'Professional Photo Booth provides free professional headshots for LinkedIn and Handshake profiles. The R'Professional Career Closet offers gently used professional clothing at no cost to ensure all students feel confident and prepared for interviews, career fairs, and presentations.

Internship Experience. Internships can be paid or unpaid, and many offer academic credit with faculty approval. These experiences build valuable workplace skills while aligning with classroom learning..

Career Fair & Events. The Career Center hosts multiple career fairs each year. Some are industry-focused like STEM, business, education, or public service, while others serve a broader audience. Students also benefit from networking events, employer panels, and on-campus or virtual interviews. These connections lead to internships, job offers, and graduate school acceptances.

From first-year exploration to post-graduation success, we guide students every step of the way.

Case Management

Director: Laurie Lee, M.S.
Student Health and Counseling Center
388 West Linden (second floor)
(951) 827-5000
casemanager@ucr.edu; casemanagement.ucr.edu

The Case Management Department is a part of the Health, Well-being and Safety Division.

The Case Management office assists students in navigating issues that interfere with their academic and personal success by providing non-clinical support directly to students and through linkage, advocacy, problem-solving and referrals to campus and community resources.

Case Managers assistance is free to any enrolled UCR undergraduate and graduate students. Students can contact us directly, without a referral. Parents, staff and faculty can refer a student, or call and consult with a Case Manager about a student of concern.

The Case Management office does not accept walk-ins, students must schedule an appointment for phone, virtual or in-person meetings. To schedule an appointment please go to our website casemanagement.ucr.edu and complete an Appointment Request form or call the front desk at (951) 827-5000.

Center for Early Childhood Education (CECE)

3333 Watkins Drive
Riverside, CA 92507
(951) 827-7454; www.ecs.ucr.edu

Early care and education services are available on campus for infants, toddlers, preschool and kindergarten children (from two months through 5 years). The centers are open to children of students, faculty, staff of UCR, and the community, and is nationally accredited.

We provide an exciting and engaging learning environment, opportunities for individual creativity and development, cooperative social interactions, and affirmation of one's culture and experiences. The needs of each child are met in a supportive and nurturing way. The curriculum at the Center for Early Childhood Education follows guidelines set by the California Department of Education and the National Association for the Education of Young Children. Teachers provide developmentally appropriate experiences in math, science, language, art, music, motor skills and social/emotional skills. They use a range of learning materials including books, puzzles, computers and art materials with regular access to outdoor play equipment. Teachers follow a daily schedule, prepare weekly lesson plans and conduct two parent-teacher conferences each year. Parents receive a written progress report at the end of each year.

We provide breakfast, lunch and a morning and/or afternoon snack. Our active parent association meets regularly to plan family-oriented events and fundraisers. Students and researchers are welcome at CECE, which features observation rooms that are available to parents as well.

Tuition assistance is available when income limits are met.

Counseling and Psychological Services (CAPS)

Director: Elizabeth Mondragon, Psy.D.
Student Health and Counseling Center (adjacent to Lot 21)
(951) 827-5531 or 951-UCR-TALK; counseling.ucr.edu
Visit us on Instagram: ucr_caps

UC Riverside's Counseling and Psychological Services (CAPS) is dedicated to creating a positive, healthy atmosphere for our undergraduate and graduate student populations, working hand-in-hand with students to provide access to confidential mental health services and resources to support and promote their academic, personal and social development. Our commitment is to help each student to thrive and achieve success at UCR by providing students access to free, confidential, and professional mental health services. All registered UCR students are eligible to be seen, **FREE** of charge, regardless of insurance status.

Clinical Services

UCR CAPS provides a range of services and programs, both in-person and virtual, to promote mental health, emotional resilience, and wellness throughout the campus community. Our clinical services include individual counseling, couples counseling, and group therapy, as well as referrals for specialized treatment needs (e.g., psychiatric services, long-term treatment, etc.). All of our clinical services are provided by diverse and multiculturally competent licensed professional clinicians and supervised doctoral interns.

UCR CAPS provides same-day in person or virtual walk-ins, and urgent consultations (M, T, W, F: 8:30 a.m. – 4:30 p.m.; Th: 9 a.m. – 4:30 p.m.) These appointments offer brief problem-solving and consultation to and about students in distress, or for those needing support with referrals.

Outreach and Education

Our professional team offers outreach, education, and consultation to faculty, staff, and students across campus. We provide training and education on a variety of mental health and wellness topics, specifically focusing our efforts on understanding, supporting and working with students who may be experiencing distress or having suicidal thoughts or concerns. CAPS utilizes a collective impact model to coordinate efforts and collaborate with other Health, Well-being and Safety division departments to support the overall mental well-being of the campus community.

Location and Accessing Services

CAPS provides FREE services to all registered UCR students. The office is open Monday – Friday (8 a.m. – 5.p.m.), except Thursdays (9 a.m. – 5 p.m.). For appointments or general inquiries: Call (951) 827-5531, option 2. To speak to a 24/7 crisis counselor immediately, call 951-UCR-TALK or (951) 827-5531, and select option 1. Visit counseling.ucr.edu for critical mental health resources on and off campus, self-help tools, and more information about our services. Visit us on the second floor of the Student Health and Counseling Center (SHCC) buildling located on Linden St., next to Lot 21.

Cultural Student Programs

African Student Programs

Director: Jamal Myrick, Ed.D.
133 Costo Hall
(951) 827-5750; asp.ucr.edu

Born from the historic struggles against oppression in all forms, African Student Programs (ASP) was created in March 1972 to sustain a socially just and inclusive campus community. At a time when scholars of African descent experienced a lack of support due to low numbers in population, ASP served as a safe haven for scholars to congregate, discuss, plan, and share as a community. Through various support services such as programmatic initiatives, advising, and leadership development opportunities, scholars from the African diaspora and those interested in learning about the culture, are able to thrive during their tenure here at UCR. Programs such as Legacy of eXcellence, 828 Summer Bridge Program, Lunch & Learns, and Village Talks, continue to celebrate those in community! Scholars are allowed to live their full truth here on the campus of UCR.

Asian Pacific Student Programs

Director: William Caganap, M.A.
244 Costo Hall
(951) 827-7272; apsp.ucr.edu

Asian Pacific Student Programs (APSP) promotes a diverse learning environment, providing UCR with opportunities to learn from and about the Asian American and Pacific Islander (AAPI) student population. Various social, cultural, and educational activities such as the AAPI Heritage Month, the Peer Mentor Program, leadership training, and AAPI Womxn's Conference are designed to assist students in their personal, academic, cultural, and social development.

Chicano Student Programs

Director: Estella Acuña
145 Costo Hall
(951) 827-3821
estella.acuna@ucr.edu; csp.ucr.edu

Founded in 1972 as a result of student, staff, and faculty activism Chicano Student Programs was the first professionally staffed Chicano/Latino cultural center in the UC System. The center has a legacy of fostering a culture of Chicano/Latino student success within and outside the institution. The center provides co-curricular inclusive programming, advocacy, intentional partnerships, leadership development, outreach, and retention efforts focused on the academic, cultural and social success of Chicano/Latino students.

Middle Eastern Student Center

Director: Gina Waneis, M.S.
111 Costo Hall

The first of its kind in both the UC system and the nation, the Middle Eastern Student Center (MESC) serves as a vibrant hub for community, cultural expression, and celebration of Southwest Asian North African (SWANA) identifies. Through educational programs, cultural events, and student support services, MESC fosters inclusion, belonging, and meaningful dialogue around cultural diversity. To support students who identify with or are interested in the SWANA experience at UCR, MESC advises affiliated student organizations, offers mentorship and internships, hosts a leadership conference, and provides a welcoming "home away from home" for all who visit.

Native American Student Programs

Director: Joshua Gonzales, M.B.A.
229 Costo Hall
(951) 827-3850; FAX: (951) 827-4145
nasp@ucr.edu; nasp.ucr.edu

Provides educational, cultural, and social support for Native American students and all students on the UCR campus and surrounding communities through Native American events such as the American Indian speaker/film series, the annual Spirit of the Tribes 5K Run/Walk, the annual Medicine Ways Conference, the annual UCR Pow Wow, "Indian Time" radio program on KUCR (88.3 FM or kucr.org), community outreach, cultural workshops, and much more.

Early Assist

arc.ucr.edu/early-assist

The Early Assist program supports first-year students in the Bourns College of Engineering (BCOE) and the College of Natural and Agricultural Sciences (CNAS) who as a result of their score on the Math Advisory Exam, place into College Mathematics Fundamentals & Problem Solving (Math 3).

Education Abroad

Jun Wang
Assistant Provost
Student Services Building, Second Floor
educationabroad@ucr.edu; international.ucr.edu/abroad
(951) 827-4113

Education Abroad provides UCR students a gateway to high-quality international opportunities, offered through academic coursework, experiential learning, immersion to cultivate intercultural understanding and collaboration. We help students acquire the skills to work in a global marketplace, and promote access to global experiences as an integral part of a UCR education through student support services, including program advising, financial counseling, academic integration, and resource sharing.

Education Abroad enhances personal growth and employability. Studying, working, and living in another country gives students space to learn things about themselves, mature as a person, become more confident, and become more responsible. Going abroad tells employers that students have ambition, the ability to adapt to change, and the skills necessary to

succeed in a multicultural environment. It gives students an edge over competition in an increasingly globalized market. Not only do students get to benefit from the depth and hands-on experience while they are studying abroad, but are more likely to have higher grades upon return.

Studies show that the biggest regret of undergraduates across the nation is not taking advantage of study abroad. Avoid regrets, contact us now. Education abroad opens mind, provides unforgettable experience, adds to learning and enhances employability.

Office of Foster Youth Support Services

Director: Stephen Morales
Bannockburn K101
(951) 827-6545
ucrfosteryouth@gmail.com; fosteryouth.ucr.edu

The Office of Foster Youth Support Services (OFYSS) provides a network of resources to current and former foster youth who are attending UCR. OFYSS offers the opportunity for students who experienced foster care to explore and realize their full potential, and connect with material and emotional support services. Services include: health and counseling services, financial aid assistance and counseling, personalized writing tutoring, admission and enrollment assistance, monthly community luncheons, quarterly community building activities, textbook assistance, and a food and hygiene pantry.

Housed within OFYSS, the Guardian Scholars Program (GSP) provides an intensive and case-managed network of resources to students who are currently in extended foster care and who will or have already "aged out" or "emancipated" from the foster care system. GSP prioritizes our most vulnerable subset of foster youth, namely those who were not reunited with kin or adopted out of the system. In addition to the support services above, students who participate in GSP are eligible for financial awards and scholarships to support their basic living expenses, educational, health, and emergency needs.

Graduate Student Association

Highlander Union Building (HUB) 203A
(951) 827-3141
gsaucr@ucr.edu; gsa.ucr.edu

The Graduate Student Association (GSA) seeks to represent the views of graduate students and promote their interests with the faculty and administration, both at the campus level and university wide. All graduate students whose fees include the GSA fee are members. It is governed by the Graduate Student Council, which comprises representatives from each of UCR's graduate programs. Officers, elected at large, are the President, Executive Vice President, Vice President of Academic Affairs, Health Insurance Chair, and Public Relations Officer.

GSA is heavily involved in campus governance and appoints students to serve on various committees.

Pre-Professional Advising Center (PPAC)

Director: Charles Scruggs
Rivera Library, B03 (Lower Level)
(951) 827-6233
ppac@ucr.edu; ppac.ucr.edu

The Pre-Professional Advising Center (PPAC) provides information, advising, and support for students who aspire to graduate/professional programs in the health and law professions and wish to enhance their academic and extracurricular preparation. Professional staff and peer mentors are available to guide students as they plan their pre-professional coursework, health and law-related experiences, service work, and research in preparation for applying to programs.

Highlander Union Building (HUB)

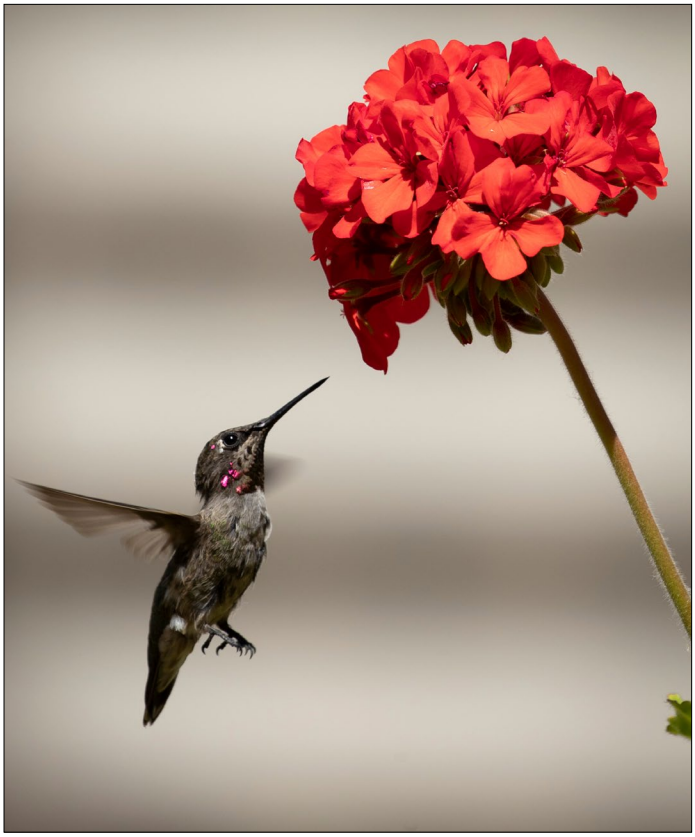
Highlander Union Building (HUB)
Highlander Union, HUB 353
(951) 827-5851; hub.ucr.edu

The Highlander Union Building (HUB) is a gathering place where students, faculty, and staff meet, eat, relax, and study. Featuring dining and retail facilities, lounges, meeting and event spaces. It also provides offices for student government, cultural programs, and various student affairs departments.

The Highlander Union Governing Board is responsible for developing facility operations policy, annual approval of the HUB Operating Budget and hosts monthly meetings open to the public. This student-majority board works to ensure that the HUB serves the needs of our campus community.

The Highlander Union offers:

- Assistance in reserving meeting space and event planning in any of the HUB Conference Rooms, Student Success Center Event Spaces or surrounding outdoor locations through HUB Scheduling. The HUB also has a variety of locations for advertising your event such as digital signage screens, display cases and beacons.
- An Information Desk designed to assist students and visitors of the Highlander Union located on the first floor. The Highlander Union's Information Desk associates are prepared to provide students and guests with directions and information about the HUB and the campus. Students can rent out tables and chairs to support their registered student organization. Students can check out laptops from the self-service kiosk located next to the Information Desk for up to 24 hours. Printers are also available for our students on the first and third floors.
- A wide range of food fare from restaurants like Coffee Bean & Tea Leaf, Subway, Panda Express, Chronic Taco, Halal Shack, and Hibachi-San Japanese Grill. For those on the go, the Scotty's Convenience Store is a quick stop to pick up a snack.
- Elev-8 Gaming Lounge is equipped with pool tables, foosball, board games, and TVs for students to enjoy. The Habit Burger Grill, located inside Elev-8 Gaming Lounge, offers a tasty menu of burgers, sandwiches, snacks, and drinks.
- Multiple lounge areas throughout the building provide comfortable places to relax and study, refill your water bottle, or heat up a meal. The outdoor Highlander Plaza and upper mall also have ATM's and provide shaded seating areas as well as tables with solar powered outlets to recharge your electronics.
- The Highlander Union Building provides numerous student employment opportunities, including Information Desk Attendants, HUB Programmers, Front Desk Assistants and Highlander Union Managers. Visit hub.ucr.edu for more information on how to apply.
- A HUB Programs team that designs and hosts a variety of events throughout the building complex for all students to enjoy. Past events have included guest lectures, movie screenings, food giveaways, Chalk the Walk, and much more!



Housing Services

Senior Director: Robert Brumbaugh
3595 Canyon Crest Drive
Riverside, CA 92507
(951) 827-6350
housinginfo@ucr.edu; housing.ucr.edu

UCR campus housing provides a variety of living environments designed to encourage both academic achievement and personal growth. Our three housing types — Residence Halls, Campus Apartments, and Family Housing — are divided into 12 distinct housing communities. Each option is designed to fit the needs of students at all levels, from newly-admitted students, to those approaching their degrees, and students with families of their own.

Living on campus — as opposed to commuting from home or living in off-campus apartment complexes — ensures that students are more completely integrated into the college community, with easy access to valuable resources and opportunities to participate with student peers in activities that complement the classroom academic experience.

Studies conducted both at the national and local UCR level indicate that living on campus, especially during the critical first year, results in higher GPA's, increases student engagement and satisfaction, as well as the likelihood of an incoming student receiving their degree.

Four **Residence Halls** are typically home to more than 4,500 first-year students living in double- and triple-occupancy rooms on co-educational halls. All Residence Hall rooms are furnished and air-conditioned, with high speed data connectivity included. A Residence Hall contract includes a selected dining plan, as well.

Some halls are intentionally arranged as Living-Learning Communities for students who share a common academic or social interest. These include:

CHASS
First-year students in the College of Humanities, Arts, and Social Sciences

Enginuity
First-year students in the Bourns College of Engineering

University Honors
First-Year and continuing students admitted to University Honors at UCR

Pre-Business
Students in the College of Humanities, Arts, and Social Sciences' Pre-Business Program

PATH (Pan African Theme Hall)
Students interested in expanding an interest in Pan African culture

Mundo
Chicanx/Latinx cultural-interest hall

Gender-Inclusive Housing
Students with diverse gender identities, expressions, and orientations

Stonewall Hall
Students of diverse gender identities and sexual orientations, as well as gender-diversity allies

SiMS (Students in Math & Science)
First-year students in the College of Natural & Agricultural Sciences

Markaz
First-year students interested in the culture and ethnicities of the Middle East, North Africa, Central & South Asia

Stride 2 Success
An intentional second-year student experience

Pathways
Helping new and continuing Transfer students thrive

In the Residence Halls, professional and student staff work together to plan activities and programs that develop a sense of community and encourage social interaction. Educational support consists of academic study groups, tutorial assistance programs, seminars, computer labs, study rooms and scheduled study hours. Social activities include hall competitions, off-campus excursions, theme dances, special dinners, mock game shows, cultural events and intramural sports. The Residence Halls also feature fitness rooms, music practice rooms and social lounges. On-site convenience stores provide snacks, school supplies and toiletries. Residential restaurants provide access to a high-quality, all-you-care-to-eat culinary program.

Seven unique **Campus Apartments** communities offer more than 5,500 Transfer, Continuing, and Graduate students the enhanced privacy of traditional apartment-style living while retaining the advantages of living on campus. Apartments range from economical, fully-furnished suites to furnished and unfurnished multi-bedroom, multi-bath apartment homes. All UCR Campus Apartments
include refrigerators, window coverings, heating, and air-conditioning. Most include full kitchens and private baths. Communities may also feature a swimming pool and spa, picnic areas with barbecue grills, recreational and study rooms, computer labs, vending machines, bike storage, secure laundry rooms and recreational space.

Professional and student staff plan social and educational activities appropriate for upperclassmen and graduate-level students. On-site staff are also trained and available to assist residents with questions, concerns, or advice regarding personal and facility needs and peer-to-peer relationships 24 hours a day.

Family Housing is available to students with families. The community is comprised of moderately-priced, unfurnished one- and two-bedroom apartment homes directly adjacent to the UCR campus. Interiors include kitchens with stoves and refrigerators, central heating/cooling, as well as complimentary Wi-Fi, and partially-subsidized utilities. Family-friendly community amenities also include a playground, covered picnic area, perimeter fence, a secure central laundry room, and on-site parking. Residential Education staff offer a family-oriented activities calendar throughout the year, as well. The Family Housing Eligibility & Assignment Policy can be viewed on the Housing website.

Students living in Campus Apartments or Family Housing who would like to broaden their food choices or create a time-saving alternative can select from an assortment of dining plans when they sign their contracts or at any other time during the year.

The **Off-Campus Housing Program** is a free online service designed to assist students with searches for housing opportunities in the community adjacent to UCR when on-campus housing is unavailable. This service includes information about and links to private apartment communities and homes for rent near to campus.

International Students and Scholars (ISS)

Director: Michael Schmelzle
Student Services Building , Second Floor, 2237
(951) 827-4113; internationalstudents@ucr.edu
international.ucr.edu

UC Riverside has a vibrant international community representing over 80 countries worldwide. We are dedicated to the success and wellness of our international students, and to creating a welcoming and safe environment that respects people from all backgrounds.

As a core function of International Affairs at UCR, International Students and Scholars (ISS) helps students get answers, find support, and connect to community seamlessly with key programs and services. ISS staff conduct pre-arrival and orientation sessions; offer cultural and adjustment advising; organize community building and support programs; coordinate workshops about employment and benefits; facilitate referrals to appropriate campus and community resources; and provide advice and guidance on all immigration issues related to student status.

All UCR students can benefit from the wide range of international programs and activities designed to develop intercultural skills and global awareness. Students can connect with the ISS office to get involved, develop their leadership and intercultural skills, and expand their professional network by participating in internationally-focused programs, special events, and community outreach. Peer-to-peer leadership opportunities through the International Orientation Leaders, and the International Student Peer Mentor Program allows students to develop as globally-minded leaders. ISS programs encourage the mutual exchange of language, culture, and knowledge. We celebrate the unique and diverse lived experiences of UCR's global community!

Lesbian Gay Bisexual Transgender Resource Center

Director: Nancy Jean Tubbs, M.S.
245 Costo Hall
(951) 827-2267; **out.ucr.edu**
Social Media: @ucrlgbtrc

Founded in 1993, the LGBT Resource Center provides support, education, and advocacy regarding sexual orientation and gender identity for the UCR campus community. The center offers a David Bohnett CyberCenter; a Resource Library of books and films; "drop-in" staff and peer support; and referrals to on- and off-campus resources.

Programs include the Community OUTreach Educators (CORE) peer education program, Tuesday Talks and other discussion groups, Q-Camp Orientation, T-Camp InterCampus Retreat, Lavender Celebration, and student-initiated campus traditions. Center staff offer campus-wide trainings on LGBTQ+ cultural competency and trans-inclusive practices.

The LGBT Resource Center works closely with student organizations, the Queer Studies Minor, Stonewall Hall LLC & Gender Inclusive Housing, the Chancellor's Advisory Committee on LGBT Students, Faculty & Staff, and members of the Common Ground Collective to make UCR a national leader in LGBTQ+ inclusion.

Office of the Ombuds

University Ombuds: Andrew Larratt-Smith, JD, MDR
Intake and Outreach Coordinator: John Medinilla, MDR
388-390 Skye Hall
(951) 827-3213
ombuds@ucr.edu; **ombuds.ucr.edu**

Anyone who has a university-related problem, is in conflict with someone on campus, or thinks they have been treated unfairly may consult the Ombuds. The Ombuds will discuss the situation with a visitor privately and confidentially, explain what policies may apply, and generate options and strategies for resolving the issue(s). The Ombuds may also help the visitor in gaining a better understanding of personal conflict approaches and styles, or may serve as an impartial facilitator or mediator to resolve disputes and conflict situations.

Some examples of issues that students have brought to the Ombuds are:

- Academic, pedagogic, or research issues;
- Disciplinary matters;
- Roommate or housing conflicts;
- Unfair treatment, harassment, bullying, or discrimination;
- Clarification on university policies or procedures;
- Ethics issues or violations of policy

In all cases, the Ombuds is confidential*, independent, impartial and informal. The Ombuds does not receive notice or maintain records on behalf of the University. The Ombuds advocates for fairness and equity, but does not advocate for individuals or entities, and does not provide legal advice. The Ombuds is an informal resource for the UCR campus community, and does not participate in formal processes. If appropriate, however, the Ombuds can aid in identifying formal options and other resources that may be available.

Please remember that email is not a secure method for relaying personal or confidential information to the Ombuds. Phone and in-person contact are encouraged.

**An exception to confidentiality exists when the Ombuds perceives there may be an imminent threat of serious physical harm to self or others.*

Police and Safety

Chief of Police: Jeff Talbott
3500 Canyon Crest Drive
9-1-1 for reporting emergencies
(951) 827-5222; **police.ucr.edu**

The **UC Police Department (UCPD)** operates 24 hours per day, 365 days a year. UCR Police officers have full police powers and are responsible for all law enforcement activities and criminal investigations on the UCR campus. Police officers work in uniform or plain clothes patrolling the campus in marked and unmarked vehicles, on bicycles, and by foot.

Incident Reporting
The university strongly encourages victims to report all criminal incidents, regardless of their nature, to the police immediately to ensure that appropriate action can be taken. Emergencies are best reported using the 9-1-1 system and nonemergencies using routine channels.

Emergencies
Any police, fire, or medical emergency on campus can be reported by the 9-1-1 emergency reporting system, campus Emergency Call Boxes, campus emergency phones located in all campus building elevators and various campus buildings, or by walk-in reporting to the Police Department. Call boxes are located in or adjacent to most campus parking lots and are indicated on campus maps.

Publication of Incidents
To increase awareness of campus safety at UCR, incidents of criminal activity within the campus community are publicized via the UCPD Annual Report and Crime Statistics online; an ongoing "press log" of Community Crime Alert Bulletins (posters); the above Web site; "Crime Watch" columns in campus housing newsletters; regular police activity reports to campus housing administrators; Crime Alert e-mails to the campus community in compliance with the "Timely Notice" provisions of the federal Jeanne Clery Disclosure of Campus Security and Campus Crime Statistics Act of 1998 ; and crime prevention programs. Details can be found at police.ucr.edu.

The **Campus Safety Escort Service** is free to students, staff, faculty, and anyone else who needs an escort. This service is available Sunday-Thursday from dark to 11:30pm.

- Pick up any red phone on campus that says Campus Safety Escort Service, which will automatically connect to the Dispatcher Desk
- Request an escort from the 1st floor HUB Information Desk or the Dispatcher Desk located inside Rivera Library
- Call the Dispatcher Desk at (951) 827-3772 and ask for an escort

ScotSurplus

Director: Robert Miller (951) 827-9034
Logistics Supervisor: Mike Gonzales (951) 827-5548
1st and 3rd Tuesday of the Month, from 11 a.m. to 4 p.m.
Located in the Corporation Yard (across from Pentland Hills)
(951) 827-4298; **cbs.ucr.edu**

The campus and local community can benefit from UCR's very own "thrift store"! From gently used furniture, computers, bicycles, clothing, books, lab supplies, skateboards, sunglasses, and musical instruments, our campus Surplus Sales are truly a treasure hunt!

ScotSurplus gladly accepts credit cards and Bear Bucks for those who wish to use their R'Card. During the summer months (July and August) Surplus Sales occur on the 1st Tuesday of the month only. We also feature retired university equipment and vehicles on our online auction website: **publicsurplus.com**

Student Alumni Association

Alumni and Visitor's Center
ucrsaa@ucr.edu; saa.ucr.edu

Affiliated with the UCR Alumni Association, a network of over 133,000 alumni, the Student Alumni Association prepares students for life after college through mentorships with successful alumni in the working world; nationally recognized career conferences; dinners with alumni; Highlander Day of Service, and other leadership-building activities. More information is available at the above website.

Student Conduct and Academic Integrity Programs (SCAIP)

Director: Tasha Yules, M.S.
(951) 827-4208; conduct@ucr.edu; conduct.ucr.edu

Student Conduct & Academic Integrity Programs (SCAIP) strives to maintain a campus environment in which the Tartan Soul principles of Accountability, Integrity, Excellence and Respect are fostered. SCAIP upholds campus standards for student conduct and academic integrity by resolving alleged violations of university policies or campus regulations. We train and educate staff, faculty, and students about the student conduct process and student rights and responsibilities. Visit SCAIP online to learn more or report student behavior of concern.

Student Disability Resource Center

Director: Laura Riley, M.S.Ed.
1228 Student Services Building
(951) 827-3861
sdrc@ucr.edu; sdrc.ucr.edu

The Student Disability Resource Center (SDRC) offers information to prospective and current students with disabilities, including chronic health issues, about potential accommodations and services available while attending UCR. Prospective students are encouraged to contact SDRC upon their decision to attend UCR. For specific information about admission requirements, contact Undergraduate Admissions, Graduate Division, or the School of Medicine.

SDRC services available to enrolled UCR students may include reviewing requests for accommodations, information on and referral to on- and off-campus resources/services, and academic support services. Students needing to request disability-related accommodations should contact SDRC to register for services. Accommodations are individually designed to meet the documented disability-related needs of a student.

Student Health, Counseling and Wellness Services

Assistant Vice Chancellor: Denise Woods, DrPH
Denise.woods@ucr.edu

Student Health, Counseling, and Wellness Services is a team of departments within Student Affairs dedicated to leading the university in creating a strong and active well-being culture at UC Riverside. The team includes Basic Needs, Counseling and Psychological Services, Student Affairs Case Management, Student Health Services, Student Disability Resource Center, Recreation, and The Well. Together they are accountable for administering, developing, assessing and improving comprehensive Student Health, Counseling, and wellness services and educational programs designed to empower all enrolled students to take charge of their health and develop life-long wellness practices. Read the description for each department to learn more about the depth and breadth of Health, Counseling, and Wellness Services available to UCR students.

Student Health Services

Senior Administrative Director: William Rall
Student Health Services Building near lot 15
(951) 827-3031
studenthealth.ucr.edu

Student Health Services provides high quality medical care that is affordable and accessible to our students. All registered students are eligible to use Student Health Services which includes primary care, women's health, pharmacy, radiology (including x-ray and ultrasound), and laboratory (including blood draw) services. Other clinical services include psychiatry, dental, and travel services.

Insurance
Health Insurance is a condition of enrollment at the University of California. All students are automatically enrolled in the UC Student Health Insurance Program (UC SHIP). The premiums are billed to the students' accounts. Student Health Services is the primary care facility for students who are enrolled in UC SHIP. Students who can demonstrate comparable insurance coverage may apply for a waiver in lieu of automatic enrollment to UC SHIP. Visit studenthealth.ucr.edu for more information on filing a waiver request.

Student Life

Director: Carly Garcia
229 Highlander Union Building (HUB)
studentlife.ucr.edu

Student Life is dedicated to the continued education and holistic development of UCR's diverse student body through programs and services aimed at helping students enhance leadership skills, develop a sense of belonging at UCR, engage in meaningful activities, and expand their understanding of social justice through divrsity, equity, and inclusion. Student Life provides a variety of campus activities and events throughout the year. Visit the Student Life website for more information about services and resources provided by the office.

Student Org Team provides comprehensive support and assistance to student organizations, including assistance with university recognition, recruitment, program and event planning, major event management, accessing university resources, understanding and negotiating university policies and procedures, organizational development and enhancement, fundraising, promotion and marketing, and communication.

Fraternity and Sorority Involvement Center is a resource center for students involved in fraternity and sorority life, as well as for students who want to learn more about what fraternity and sorority life has to offer. The FSIC provides assistance with recruitment, event planning, scholarship, philanthropy, and community service for fraternity and sorority life on campus.

Highlander Spirit and Traditions provides a variety of activities and opportunities for students, staff, and faculty to show their Highlander pride and spirit.

Highlander Orientation helps new first year and transfer students get to know the university and become acclimated to UCR. Highlander Orientation provides opportunities to meet other first year students, receive academic advising, enroll in classes, and learn about campus resources to help students be successful.

New Student Programs assist new students, both first-year and transfer, in starting off on the right track in their college experiences through mentorship programs, workshops and leadership opportunities. New Student programs serves all students, including specific resources and activities for commuter students to stay connected to UCR.

Community Service Programs provides resources to students and student organizations to track their service hours and to find service opportunities. communityservice.ucr.edu

Leadership Programs provides students with opportunities to strengthen and develop leadership skills. This area offers a number of different programs including Leadership Week and the Leadership Certificate Program.

Transfer Success Program

arc.ucr.edu/tsp

The Transfer Success Program is a support program for incoming and matriculated transfer students. In collaboration with campus wide partners, the program provides programming and connects students to student success services to empower them in their academic, professional, and personal endeavors while assisting students in navigating the university system. The Transfer Success Zone, located in the Academic Resource Center, provides a space for transfer students to meet and attend events that address their needs.

Transportation and Parking Services

Director: Irma Henderson
683 Linden Street
Riverside, CA 92507
(951) 827-TAPS (8277)
transportation.ucr.edu

Transportation and Parking Services (TAPS) is responsible for the coordination and administration of all transportation related services including flexible parking permit options, subsidized transit passes, bike and scooter registration, and other sustainable transportation programs to help you get to and around the campus community.

A valid UCR parking permit must be associated with your vehicle at all times for anyone parking on the UC Riverside campus. Students can purchase their parking permits online. Visitors can purchase all-day parking permits at the Information & Parking kiosks located on campus. Short term parking is available in specific lots via self-serve pay stations or via the Park Mobile app. Visit the TAPS website listed above for more information including parking lot maps and permit rates.

UCR Bookstore (Barnes & Noble)

Director: Robert Miller (951) 827-9034
Store Manager: Tabitha Rosser (951) 827-4446
UCR Bookstore hours (fall 2025):
Monday – Friday (8 a.m. – 5 p.m.) • Saturday (11 a.m. – 3 p.m.)
Northeast of the Highlander Union Building (HUB)
(951) 827-BOOK (2665); ucr.bncollege.com

The UCR Bookstore is your one stop shop on campus. From affordable textbook options to school supplies, convenience items, and official Highlander gear, your campus store has everything you need for your academic career. The partnership between UCR and Barnes & Noble ensures that industry leading service, while still allowing a portion of bookstore proceeds to go directly back to the university. When you shop with your campus store, the money you spend on campus, stays on campus!

Textbook Price Matching.
The UCR Bookstore will price match any textbook retail price from competitors like Barnes & Noble and Amazon. Price match does not apply to Amazon Marketplace or other third party student-to-student sellers.

Save with Rental Books.
Students can save up to 80% by renting vs. buying textbooks. Rental books provide one of the most affordable options for students and the great thing is that you can still highlight and underline while studying! Rental books are due back the last day of the academic quarter and reminders will be sent.

UCR Gear.
The UCR Bookstore is the official supplier of and features the largest selection of UCR and Highlander clothing and gifts! From brands like Champion, NIKE, and League, you sure to find the perfect way to show your school spirit!

Refunds.
Textbooks are refundable one week from the start of academic term with receipt and as long as books are in original condition. After the first week of classes, textbook refunds can be given with proof of schedule change and original receipt. All other merchandise can be refunded within 14 days of purchase with valid receipt.

UCR Dining & Hospitality Services

Executive Director: Marcus Van Vleet
3595 Canyon Crest Drive
Riverside, CA 92507
diningservcies@ucr.edu
dining.ucr.edu

UCR Dining & Hospitality Services offers diverse culinary choices, encompassing residential restaurants, food courts, markets, coffee shops, and campus restaurants. With a wide range of dining options and services, UCR's dining program includes:

Residential Restaurants: UCR has two residential restaurants, Glasgow and Lothian Dining. These restaurants offer elevated dining experiences with chef-inspired menus, gourmet dishes, and themed events. They provided all-you-care-to-eat meal options and accommodated various dietary preferences, including vegetarian, vegan, and gluten-free choices.

Campus Restaurants + Markets: You'll find a delightful array of campus restaurants and markets, each offering a unique dining experience. These dining locations encourage students to explore a variety of flavors beyond our residential restaurants, making mealtime a truly enjoyable and diverse experience.

Locations include:

- **The Barn**
- **The HUB Dining Plaza** (Panda Express, The Halal Shack, Hibachi San, Chronic Tacos, Subway, The Habit Burger Grill, Coffee Bean Tea & Leaf)
- **Campus Coffee Shops** (Emerbee's Cafe, Bytes, and Ivan's)
- **The Market at Glen Mor** (Starbucks + Noods: The Noodle Bar)
- **The Market at North District** (Lollicup Fresh Boba and Fry House)
- **Scotty's C-stores** (HUB, Glasgow, School of Medicine)

Dining Plans: Optimize your campus dining experience with our convenient, prepaid meal packages, known as Dining Plans. These plans are designed to cater to regular on-campus dining needs; dining plans provide both convenience and flexibility. For further details on our dining plans and how they can enhance your dining experience, please visit our website at dining.ucr.edu/dining-plan-options.

Sustainable Dining: UCR Dining strives to source locally produced, organic, and sustainable ingredients whenever possible, promoting environmentally conscious practices.

Overall, UCR's Dining & Hospitality program plays a crucial role in fostering a sense of community, supporting students' well-being, and enhancing the overall campus experience. For more information, please visit our website at dining.ucr.edu.

Undocumented Student Programs

Director: Sonia Garcia Avelar, M.Ed.
224 Costo Hall
(951) 827-2193
usp@ucr.edu, usp.ucr.edu

The UCR Undocumented Student Programs supports undocumented students and immigration-impacted students to succeed in higher education and prepare for post-graduation. Founded in 2015, Undocumented Student Programs (USP) provides critical institutional support and resources that empower undocumented students to thrive academically, personally, and professionally. USP offers personalized one-on-one advising on academic planning, career development, and financial aid navigation. The program also connects students to free legal services through the UC Immigrant Legal Services Center and helps reduce financial barriers through its Lending Library, which provides access to textbooks and calculators, as well as the R'Dream Scholarship and Book Grant. USP promotes student growth through leadership opportunities, graduate school preparation workshops, and professional and academic fellowship opportunities. The program also provides Undocu Ally training for staff and faculty to build supportive campus environments.

University Advancement

Vice-Chancellor for University Advancement: Peter Hayashida, M.S.
4128 Hinderaker Hall
(951) UCR-NEWS (827-6397); ucr.edu

Headed by the Vice Chancellor for University Advancement, this division has primary responsibility for generating external support for the campus, through fund-raising, strategic media relations, marketing, campus publications such as the campus magazine, video production services, the UCR home page, event planning, and alumni services, including a Student Alumni Association.

University Writing Program (UWP)

1003 HMNSS
(951) 827-1384
uwp.ucr.edu

The University Writing Program (UWP) offers courses that fulfill the UCR writing requirement. These courses are designed to help students write effectively in other University courses and later in their professional lives. University writing demands the ability to read carefully, to analyze what is read, and to draw conclusions about those data for both general and expert audiences. Our courses help students learn to write well, read closely, and speak formally in public.

Veterans Resource Center

Coordinator: Tamara Thacker
(951)827-2099
125 Costo Hall
veterans.ucr.edu

Our Veterans Resource Center is a hub of information for all military-affiliated students, including student veterans, spouse and children dependents of veterans, and even active and reservist military members. The VRC works closely with Financial Aid to help answer questions about financial benefits that one might receive from the military, as well as working with our Career Center to help veterans find employment following their time at UC Riverside.

The VRC is located physically at 125 Costo Hall, including a social space to meet other veterans, study rooms, office space to meet with staff members, and even a kitchenette to keep and prepare food.

Our Veterans Resource Center and the services we offer to veterans is expansive, with UCR being ranked the #1 research institution in the country for student veterans in 2019-2020.

Vocational Rehabilitation Services

State Department of Rehabilitation
2010 Iowa Ave, Suite 100
Riverside, CA 92507
(951) 782-6650 (Voice) or (844) 729-2800 (TTY); dor.ca.gov

Students who have a disability that impacts them vocationally may be eligible for services from a state department of rehabilitation office, including vocational counseling and guidance, training (with payment of costs such as books, fees, and tuition), and job placement.

Voter Registration

Students who need to register to vote for the first time, or re-register because they have moved, or want to switch their party affiliation, can learn more at vote.ucr.edu or by visiting the Student Life Office in HUB 229.

You must be registered at least 15 days prior to an election in order to be eligible to vote in that election.

The Well

(Well-being, Empowerment, Life, Learning)

Highlander Union Building 248
(951) UCR-WELL (827-9355)
thewell@ucr.edu; well.ucr.edu

The Well is UCR's health promotion department focused on holistic student well-being. The Well provides health education, training, resources, and programming for students in a variety of topic areas, through a network of peer educators, mentors, and professional staff. Health education topics include alcohol & other drugs, sexual health & reproductive justice, mental well-being, stress, sleep, and more. Students can attend our events, and join one of our peer groups to engage with public health topics on campus and to gain leadership skills.

At The Well, we understand that it can be challenging to maintain health and wellness. Our work centers on increasing access to information and resources, and helping students remove barriers to well-being, in support of academic and personal success. We provide students with free access to health-supporting resources, including safer sex supplies, period products, stress balls, sleep kits, COVID safety-related health supplies, and herbal tea. Check our website for current department hours and general information, and follow us on Instagram @thewellucr to stay current on our resources, services, and events.

Women's Resource Center

Director: Nina Ruelas, M.S., L.M.F.T.
260 Costo Hall
(951) 827-3337; wrc.ucr.edu

The Women's Resource Center (WRC) provides advocacy, educational programs, informal counseling, enrichment activities, support groups, and referrals for the entire UCR student community. Its goals are equity, access, outreach, retention, knowledge and skill development, safety, and a general sense of well-being. Core services include the Campus Safety Escort Service, self-defense classes, The Persist Women's Political Engagement Conference and other groups, initiatives, events, drop-in hours, and volunteer opportunities throughout the year.

The **Campus Safety Escort Service** provides safety escorts that will walk or drive you to and from your car or a nearby destination. This service, comprised of trained student volunteers, is available **Sunday-Thursday from dark to 11:30pm** by calling **(951) 827-3772**, using the red direct dial telephone located on the first floor of most campus buildings, or by dropping by the HUB or Rivera Library lobbies. To volunteer, just complete an application online at https://wrc.ucr.edu/programs/campus-safety-escort-service or stop by the Women's Resource Center, **260 Costo Hall**.



PROSPECTIVE UNDERGRADUATES

Campus Tours

Campus Tours Office
1137 Student Services Building
(951) 827-TOUR (8687)
tour@ucr.edu; visit.ucr.edu

Visitors can learn about UCR's history, academic programs, research, and more from a current undergraduate student. Weekday and select Saturday tours include a 30-minute presentation followed by a 1-hour campus tour. Reserve your spot at admissions.ucr.edu/visit.

Early Academic Outreach Program (EAOP)

2210B Student Services Building, 2nd Floor
(951) 827-4695; fax (951) 827-4762
eaop.ucr.edu; facebook.com/UCREAOP

As UC's largest academic preparation program, EAOP provides academic advising to high school students who are first generation, economically disadvantaged, and English Language Learners about college admission requirements. The Program also provides students with assistance when completing their college and financial aid applications. Service areas include select schools in Riverside and San Bernardino Counties.

Student Disability Resource Center (SDRC)

1228 Student Services Building
(951) 827-3861
sdrc@ucr.edu; sdrc.ucr.edu

The SDRC is avaiable to provide prospective and currently enrolled UCR students with information about disability-related accommodation processes, services, and other concerns related to access and attending UCR. Prospective students are encouraged to contact the SDRC as soon as they submit their Statement of Intent to Register (SIR) at UCR. Services may include information and referrals to on- and off-campus resources and academic access support.

TRIO Pre-College Programs

2210B Student Services Building, 2nd Floor
(951) 827-4685, fax (951) 827-4762
trio.ucr.edu

TRIO Pre-College Programs (Educational Talent Search, Upward Bound Classic, Upward Bound Oasis, Upward Bound Rialto/Colton Joint) provide services to income-qualified and/or potential first-generation college-bound high school students in their preparation for college entrance through grants provided by the United States Department of Education. The Pre-College programs partner with select high schools in Riverside and San Bernardino counties to assist participants as they complete high school and successfully enroll in a postsecondary institution. Pre-College participants receive free services including: academic advising, tutoring, information about college admissions, mentoring, summer residential programs, study skill development workshops, college application support, financial aid application support, Financial Literacy workshops, major and career exploration, and cultural and educational field trips.

University Eastside Community Collaborative (UECC)

2210B Student Services Building, 2nd Floor
(951) 827-2514
uecc@ucr.edu; uecc.ucr.edu

The UECC provides an opportunity for undergraduate college students to become engaged in their community as AmeriCorps members and provide tutoring and mentoring in local schools and community centers. UECC members receive a monthly stipend, professional development, and the opportunity to leave a lasting impact on Riverside's Eastside and University neighborhoods.

UECC members provide tutoring, mentoring, and homework help to lower performing students in literacy and mathematics in grades K-6 while receiving supervisory support from in-classroom teachers. In after-school programs and during summer camps, UECC members are guided by Riverside Parks and Recreation professional staff to engage local students in enrichment activities to support their academic, personal and socio-emotional growth. As an AmeriCorps program, UECC members participate in meaningful community service projects that improve the quality of life for residents of the City of Riverside. Upon completing a year of service, UECC members earn the prestigious Segal AmeriCorps Education Award.




adidas
UCR

UNDERGRADUATE ADMISSION

Application for Admission

Serving high school and community college students, their parents, and counselors, Undergraduate Admissions provides information about college preparation and admission of new undergraduate first-year and transfer students. Admission Counselors visit high schools and community colleges to provide individual preadmission advising to students. The office hosts various events throughout the year which give prospective students and their families the opportunity to visit the campus; meet faculty, staff, and students; and learn more about UCR and its programs and opportunities for undergraduates.

Undergraduate Admissions
3106 Student Services Building
University of California, Riverside
900 University Avenue
Riverside, CA 92521
(951) 827-3411

Prospective Students may contact undergraduate admissions via admissions.ucr.edu/ask.

When to Apply

UCR accepts applications for admission to all undergraduate majors for first-year and transfer students during the priority filing period, October 1–November 30.

How to Apply

Prospective applicants may apply online:
admission.universityofcalifornia.edu.

First-Year Student Admission

UCR seeks to recruit and admit an academically strong student body that has demonstrated the rigorous preparation needed for admission to a major research institution and reflects the diversity of our state and region.

This section describes the two-phase undergraduate admission and selection process at UCR:

1. Satisfying the University of California minimum admission requirements
2. Selection by UCR according to the principles of Comprehensive Review, as determined by the UCR faculty

Meeting UC minimum admission requirements will not guarantee admission to UCR. Applicants who seek to increase their likelihood for admission should strive for achievement well beyond UC minimum requirements.

Final determination of admission will be made within the context of campus enrollment goals.

UC Admission Requirements

First-year students interested in entering the University as first-year need to satisfy the following requirements:

1. **Complete a minimum of 15 college-preparatory courses (a-g courses) with at least 11 finished prior to the senior year.** The a-g course requirements are shown in the box on this page. More information about the a-g course requirements can be found at admission.universityofcalifornia.edu/admission-requirements/freshman-requirements/subject-requirement-a-g.html. The university will accept only those "a-g" courses that appear on the official UC-Certified Course List for the California high school the student attended. The UC-Certified course list is available at hs-articulation.ucop.edu/agcourselist. Students who have attended high school outside the state of California will have their high school coursework evaluated in the context of the general A-G requirements noted on this page.
2. **Earn a grade point average (GPA) of 3.0 or better (3.4 for non-residents) in these courses with no grade lower than a C.**
   - **a. Honors Courses**
     The GPA calculation includes honors-level courses that are certified by the University of California, such as Advanced Placement (AP), International Baccalaureate (IB) Higher Level and select Standard Level courses, and transferable college-level courses. UC assigns extra grade points for up to four year-long honors courses taken in grades 10 and 11, with grades of A, B, and C weighted as 5, 4, and 3 points respectively. A maximum of two honors-level courses taken in 10th grade can receive this weighted GPA boost. Grades of D or below do not receive any extra points, and only courses approved by UC for honors designation are eligible for this additional credit.

"a-g" Subject Requirement

a. History/Social Science (2 years required)
Two years of history/social science, including one year of U.S. history or one-half year of U.S. history and one-half year of civics or American government; and one year of world history, cultures, and geography.

b. English (4 years required)
Four years of college preparatory English that include frequent and regular writing, and reading of classic and modern literature. Not more than two semesters of ninth-grade English or no more than one year of approved ESL-type courses can be used to meet this requirement.

c. Mathematics (3 years required, 4 years recommended)
Three years of college preparatory mathematics that include the topics covered in elementary and advanced algebra and two- and three-dimensional geometry. Approved integrated math courses may be used to fulfill part or this entire requirement, as may math courses taken in the seventh and eighth grades that the student's high school accepts as equivalent to its own math courses.

d. Science (2 years required, 3 recommended)
Two years of college-preparatory science, including or integrating topics that provide fundamental knowledge in two of these three subjects: biology, chemistry, or physics. One year of approved interdisciplinary or earth and space sciences coursework can meet one year of the requirement. Computer Science, Engineering, Applied Science courses can be used in area D as an additional science (i.e., third year and beyond).

e. Language Other Than English (2 years required, 3 years recommended)
Two years of the same language other than English. Courses should emphasize speaking and understanding, and include instruction in grammar, vocabulary, reading, composition, and culture. Courses in language other than English taken in the seventh and eighth grade may be used to fulfill part of this requirement if the student's high school accepts them as equivalent to its own courses.

f. Visual and Performing Arts (1 year required)
A single yearlong approved arts course from a single visual and performing arts discipline: dance, drama or theater, music, or visual art.

g. College Preparatory Electives (1 year required)
One year (two semesters) in addition to those required in "a–f" above, chosen from visual and performing arts (nonintroductory-level courses), history, social science, English, advanced mathematics, laboratory science, and language other than English (a third year in the language used in the "e" requirement or two years of another language).

3. Testing Requirement

UC Riverside will not consider SAT or ACT test scores when making admission decisions or awarding scholarships. If you choose to submit test scores as part of your application, they may be used as an alternative method of fulfilling minimum requirements for eligibility or for course placement after you enroll.

2024 Graduation Rates

The following information is provided by UCR's Institutional Research (ir.ucr.edu). Percentages represent the share of the cohort starting in the indicated fall term that graduated within the specified time. Graduation rates are cumulative and are measured through the final summer of the corresponding year.

6-Year Rate for the 2017 Cohort: 76.2%

4-Year Rate for the 2019 Cohort: 59.4%

UCR Comprehensive Review

Comprehensive review is the process by which UCR evaluates first-year applicants, who meet minimum UC requirements, using multiple measures of achievement and promise, while considering the context in which each student has demonstrated accomplishment.

Paths to Admission for California Residents

For the highest-achieving California applicants, we have two paths to admission. If you are in one of the following groups and you are not admitted to any of the UC campuses you apply to, you may be offered a spot at another campus if space permits.

1. Statewide Path

Students who rank in the top 9 percent of California high school students according to the UC admissions index, which can be found at admission.universityofcalifornia.edu/admission-requirements/freshman-requirements/california-residents, or

2. Local Path (ELC)

Students who rank in the top 9 percent of their graduating class at a participating high school. Students whose high schools participate in the ELC program – which most California high schools do – will be identified to be in the top 9 percent on the basis of GPA in UC-approved coursework completed in the 10th and 11th grades. To be considered for ELC, students must have a minimum GPA of 3.0 and complete the following a-g courses prior to their senior year:

a. History/Social Science	1 Year
b. English	2 Years
c. Mathematics	2 Years
d. Laboratory science	1 Year
e. Language other than English	1 Year
f. College-preparatory elective (chosen from the subjects listed above or another course approved by the university)	4 Years

After students enter their coursework and grades in their applications, the University of California will compare their GPAs to the historic top GPA for their school. Students who meet or exceed that GPA, will be identified as ELC and will be designated as such on their application. For more information on this process, go to Local guarantee (ELC).



Transfer Student Admission

The university considers a transfer applicant a student who has graduated from high school and enrolled in a regular session at a college or university immediately following the summer after high school graduation. (Students cannot disregard their college record and apply as a first-year.)

California Residents must complete the following to meet minimum admission requirements:

1. Complete 60 semester (90 quarter) units of transferable college credit with at least a 2.4 GPA (2.8 for nonresidents). No more than 14 semester (21 quarter) units may be taken Pass/Not Pass.
2. Complete the following seven transferable college courses, earning a grade of C or better in each course:
   a) Two courses in English (1 course in English Composition, 1 course in Critical Thinking);
   b) One course in mathematical concepts and quantitative reasoning;
   c) Four courses chosen from at least two of the following subject areas: arts and humanities, social and behavioral sciences, and physical and biological sciences.

Each course must be worth at least 3 semester (4–5 quarter) units.

Students who satisfy the California General Education Transfer Curriculum (Cal-GETC) or General Education Transfer Curriculum (IGETC) prior to transferring to UC, may satisfy the seven-course pattern outlined above, depending on the courses taken. For more information, visit **assist.org.**

College-Level Examination Program

The UC does not grant credit for scores earned on the College-Level Examination Program (CLEP).

UC Intercampus Transfer

A regular undergraduate student who is registered at any campus of the UC may apply for transfer to another campus of the UC by filing the UC Undergraduate Application for Admission and Scholarships. Fees and procedures are the same for all undergraduates, and there is no special procedure for intercampus transfer.

Student Conduct

Disciplinary suspension or dismissal from a previously attended educational institution is considered in the admission decision.



Credits, Transcripts, and Test Scores

Credit for English-as-a-Second-Language Course Work
Students whose first language is not English may receive up to 12 quarter units of credit for English-as-a-second-language course work. Students may receive workload credit (for financial aid purposes) for courses taken beyond this 12-unit limit but will not receive additional unit credit applicable to the bachelor's degree.

Credit for Native Language
Students whose first language is not English may receive credit for course work in their native language and literature, provided such courses were completed at the college level in the country of the first language or at the upper-division or graduate level at UCR or another accredited English-speaking institution.

Unit Credit for Courses Taken Elsewhere
The University grants unit credit only for courses consistent with its curriculum that have been completed at other accredited colleges and universities. To be accepted for credit, the courses must be comparable to those offered at the university.

Undergraduate Admissions determines the acceptability of courses taken at an institution other than the university. The faculty of the particular school or college in which the student plans to enroll determines the applicability of such course work in satisfaction of degree requirements.

As an integral part of the system of public education of California, the university accepts approved transfer courses at full unit value that have been completed with satisfactory grades in the community colleges of the state of California.

Limitations on Transfer Credits
Students will be granted up to 70 semester/105 quarter units of credit for lower-division coursework completed at any institution or any combination of institutions. For units beyond the maximum, subject credit for appropriate coursework taken in excess of this unit limitation will be granted and may be used to satisfy requirements.

- Units earned through: AP, IB, and/or A-Level examinations are not included in the limitation and do not put applicants at risk of being denied admission.

Units earned at any UC campus (Extension, summer, cross/current and regular academic year enrollment) are not included in the limitation but are added to the maximum transfer credit allowed and may put applicants at risk of being denied admission due to excessive units.

Transcripts and Test Scores
Undergraduate Admissions requires complete, accurate, and up-to-date information about a student's academic program and work in progress in order to process and respond to the application in a timely manner. The transcript and other documents submitted as part of the application become the property of the university; they cannot be returned or forwarded in any form to another college or university.

First-Year Applicants
Applicants are notified if a preliminary high school transcript is required. If submitting standardized test scores for consideration, applicants are responsible for requesting that testing agencies report to UCR Undergraduate Admissions.

Transfer Applicants
Applicants are notified if the university requires a preliminary transcript(s). Applicants must request a final transcript from each college they attended. A transcript from the last high school they attended may also be required. Attendance at any other school or college after an application has been filed is considered to be part of the student's record and must be reported to Undergraduate Admissions. Transcripts are due to the Office of Undergraduate Admission postmarked on or before July 1st. All other required information is due postmarked on or before July 15th.

Selection Criteria — Transfer Applicants

UCR attempts to accommodate as many qualified students from other universities and colleges as possible, particularly as juniors and seniors.

In addition to meeting minimum UC eligibility requirements, transfer students will be selected on the basis of academic preparation as assessed by their GPA in all transferrable coursework and completion of required major preparatory coursework where applicable. Applicants with 120 quarter units or more are also subject to screening beyond the minimum requirements for transfer students.

School of Business
Business Administration admission is selective based on the GPA in all transferrable coursework with a minimum GPA of 2.7. It is preferred that applicants complete the Intersegmental General Education Transfer Curriculum (IGETC) or California General Education Transfer Curriculum (Cal-GETC), or all breadth requirements, along with the seven published lower-division business prerequisites (with a minimum GPA of 2.5). Students should visit **assist.org** for updated and comprehensive major preparation requirements.

Bourns College of Engineering
Students are selected on the basis of academic preparation. Admission is selective based on the GPA in all transferrable coursework with a minimum GPA of 2.8, and completion of required major preparatory course work. See Admission to Majors under the Marlan and Rosemary Bourns College of Engineering section of this catalog or go to **assist.org**. For further information call Student Academic Affairs at (951) 827-ENGR (3647).

College of Natural and Agricultural Sciences
Students are selected primarily on the basis of academic preparation, as assessed by their GPA in academic coursework and strength of preparation for the intended major. Admission is selective based on the GPA in all transferable coursework with a minimum GPA of 2.7 and completion of required major preparatory coursework. Students should visit **assist.org** for updated and comprehensive major preparation requirements.

College of Humanities, Arts and Social Sciences
Admission is selective based on GPA in all transferrable coursework with a minimum GPA of 2.4. Neuroscience and Psychology applicants must have a minimum GPA of 2.7 in all transferable college coursework. Psychology applicants must also have a minimum of one UC transferable mathematics course equivalent to Math 004 or higher. Business Economics and Economics applicants must also have a minimum of one UC transferable mathematics course equivalent to Math 1A. For further information call Student Academic Affairs at (951) 827-3683. Students should visit **assist.org** for updated and comprehensive major preparation requirements.

School of Public Policy
Students are selected primarily on the basis of academic preparation, as assessed by their GPA in academic coursework and strength of preparation for the intended major. Admission is selective based on the GPA in all transferable coursework with a minimum GPA of 2.4 and completion of required major preparatory coursework. Students should visit **assist.org** for updated and comprehensive major preparation requirements.

School of Education
Students are selected primarily on the basis of academic preparation, as assessed by their GPA in academic coursework and strength of preparation for the intended major. Admission is selective based on the GPA in all transferable coursework with a minimum GPA of 2.4 and completion of required major preparatory coursework. Students should visit **assist.org** for updated and comprehensive major preparation requirements.

120 Quarter Units or More
Applications from UC-eligible applicants with 120 quarter units or more of transfer credit are reviewed by the Associate Dean of the College for completion of a specified pattern of courses that provides continuity with upper-division courses within the major.

Admission to Special Categories

Undergraduate Admissions does not accept applications for Limited Status or Second Baccalaureate degrees.

Notification of Admission

UC Riverside communicates with applicants and admitted students by email. Make sure the email address on file is current. Admission decisions are posted on their applicant portal at My.UCR.edu. First-year applicants will be notified by March 31, and transfer applicants will be notified by April 30.

To accept UC Riverside's offer of admission, log in to the applicant portal and complete the Statement of Intent to Register (SIR) along with the Statement of Legal Residence (SLR) for tuition purposes. A nonrefundable $250 deposit is due at the time of submission and will be applied toward your tuition. The applicant portal guides you through the steps to accept the offer online. If you do not submit the reply before the deadline, you will be denied enrollment due to space limitations. The deadlines to accept the offer of admission and submit the California Residency. Questionnaire for Tuition Purposes are:

– May 1 — First-year students
– June 1 — Transfer students

Concurrent Enrollment

Taking courses at another college or university, including UCR Extension, while in residence at UCR is called concurrent enrollment. See Finances and Registration for the policy regarding concurrent enrollment for continuing students.

Reapplication

Admission is granted for a specific term only. If a student is not admitted or chooses not to enroll, they must submit a new application and pay the application fee to be considered for a future term. Reapplications are reviewed based on the admission requirements and space availability at the time of the new application.

International Baccalaureate

The university grants 8 quarter units credit for each International Baccalaureate (IB) higher level examination on which a student scores 5 or higher. Higher level examinations are considered honors courses. The university does not grant credit for subsidiary level examinations. Some higher level examinations may be considered equivalent to first-year level courses in the subject and may be used to satisfy general education or breadth requirements. The units granted for IB examinations are not counted toward the maximum number of credits required for formal declaration of an undergraduate major or the maximum number of units one may accumulate prior to graduation from the university. Students who enter the university with IB credit do not have to declare a major earlier than other students nor are they required to graduate earlier.

See International Baccalaureate Examination Credit chart on next page.



International Baccalaureate Examination Credit

IB Examination	IB Score	Unit Credit	Bourns College of Engineering	College of Humanities, Arts and Social Sciences/School of Business/School of Education/School of Public Policy	College of Natural and Agricultural Sciences
Biology	5, 6, 7	4	Elective	Natural Sciences and Mathematics (Biological Sciences) breadth	Elective
		4	Elective	Elective	Elective
Business and Management	5, 6, 7	8	Elective	Elective	Elective
Chemistry	5, 6, 7	4	Elective	Natural Sciences and Mathematics (Physical Sciences) breadth	Elective
		4	Elective	Elective	Elective
Classical Languages	5, 6, 7	4	"Additional Humanities" breadth	"Additional Humanities" breadth	"Additional Humanities" breadth
		4	Elective	Elective	Elective
Computer Science	5, 6, 7	4	Elective	Computer Science breadth	Computer Science breadth
		4	Elective	Elective	Elective
Dance	5, 6, 7	8	Elective	Elective	Elective
Economics	5, 6, 7	4	Credit for ECON 002	Credit for ECON 002	Credit for ECON 002
		4	Credit for ECON 003	Credit for ECON 003	Credit for ECON 003
English: Language and Literature	5, 6, 7	8	Elective	Elective	Elective
English: Language B	5, 6, 7	8	Elective	Elective	Elective
English: Literature	5	4	Credit for ENGL 001A	Credit for ENGL 001A	Credit for ENGL 001A
		4	Elective (or 8 elective units if student enrolls in ENGLA 001A)	Elective (or 8 elective units if student enrolls in ENGLA 001A)	Elective (or 8 elective units if student enrolls in ENGLA 001A)
	6, 7	4	Credit for ENGL 001A	Credit for ENGL 001A	Credit for ENGL 001A
		4	Credit for ENGL 001B	Credit for ENGL 001B	Credit for ENGL 001B
English: Literature and Performance	5, 6, 7	8	Elective	Elective	Elective
Film	5, 6, 7	8	Elective	Elective	Elective
Further Math	5, 6, 7	8	Elective	Elective	Elective
Geography	5, 6, 7	4	Credit for GEO 002	Credit for GEO 002	Credit for GEO 002
		4	"Additional Social Sciences" breadth	"Additional Social Sciences" breadth	"Additional Social Sciences" breadth
Global Politics	5, 6, 7	8	Elective	Elective	Elective
History	5, 6, 7	4	Credit for HIST 020	Credit for HIST 020	Credit for HIST 020
		4	Elective	Elective	Elective
History of the Islamic World	5, 6, 7	4	"Additional Humanities" breadth	"Additional Humanities" breadth	"Additional Humanities" breadth
		4	Elective	Elective	Elective
Languages other than English	5, 6, 7	8	Elective	Elective	Elective
Math	5, 6, 7	4	Credit for MATH 009A	Credit for MATH 009A	Credit for MATH 009A
		4	Elective	Elective	Elective
Music	5, 6, 7	4	Elective	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
		4	Elective	Elective	Elective
Philosophy	5, 6, 7	4	Credit for PHIL 001	Credit for PHIL 001	Credit for PHIL 001
		4	Elective	Elective	Elective
Physics	5, 6, 7	4	Elective	Natural Sciences and Mathematics (Physical Sciences) breadth	Elective
		4	Elective	Elective	Elective
Psychology	5	4	Social Sciences (Psychology) breadth	Social Sciences (Psychology) breadth	Social Sciences (Psychology) breadth
		4	Elective	Elective	Elective
	6, 7	4	Credit for PSYC 002	Credit for PSYC 002	Credit for PSYC 002
		4	Elective	Elective	Elective
Social Anthropology	5, 6, 7	4	Elective	Elective	Elective
		4	Elective	Social Sciences breadth	Social Sciences breadth
Theatre Arts	5, 6, 7	8	Elective	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
Visual Arts	5, 6, 7	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadt
		4	Elective	Elective	Elective

Note: Certain credit limits apply to Advanced Placement and International Baccalaureate tests offered in similar subject areas.

See "Programs and Courses" for subject abbreviations

Advanced Placement

The university grants credit for all College Board Advanced Placement Tests for which a student scores 3 or higher. The credit may be subject credit, graduation credit, or credit toward general education or breadth requirements, as determined by each college office.

The units granted for AP tests are not counted toward the maximum number of credits required for formal declaration of an undergraduate major or the maximum number of units a student may accumulate prior to graduation from the university. Students who enter the university with AP credit do not have to declare a major earlier than other students, nor are they required to graduate earlier.

College courses taken prior to or after enrolling at the university may duplicate the content of AP examinations. In these cases, the university may not award credit for both the course and the AP exam. The university grants credit for Advanced Placement tests as described below.

College Board Advanced Placement Examination Credit

AP Examination	AP Score	Unit Credit	Bourns College of Engineering	College of Humanities, Arts and Social Sciences/School of Business/School of Education/School of Public Policy	College of Natural and Agricultural Sciences
Art History	3, 4, 5	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
		4	Elective	Elective	Elective
Studio Art[1]					
• Drawing	3, 4, 5	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
		4	Elective	Elective	Elective
• 2-D Design	3, 4, 5	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
		4	Elective	Elective	Elective
• 3-D Design	3, 4, 5	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
		4	Elective	Elective	Elective
• General Portfolio[3]	3, 4, 5	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
		4	Elective	Elective	Elective
Biology	3, 4, 5	4	Natural Sciences and Mathematics (Physical Sciences) breadth	Natural Sciences and Mathematics (Physical Sciences) breadth	Elective
		4	Elective	Elective	Elective
Chemistry	3, 4, 5	3	Credit for CHEM 001W plus Natural Sciences and Mathematics (Physical Sciences) breadth	Credit for CHEM 001W	Credit for CHEM 001W
		5	Elective	Elective	Elective
Chinese Language and Culture	3, 4	8	Elective	Elective	Elective
	5	4	"Additional Humanities" breadth		
		4	Elective		
Computer Science					
• A Examination[2]	3	8	Elective	Elective	Elective
	4, 5	4	Credit for CS 010A	Credit for CS 010A	Credit for CS 010A
		4	Elective	Elective	Elective
• AB Examination[2, 3]	3, 4	4	Credit for CS 010A	Credit for CS 010A	Credit for CS 010A
	5	4	Credit for CS 010B	Credit for CS 010B	Credit for CS 010B
• Principles	3, 4, 5	8	Elective	Elective	Elective
Economics					
• Macroeconomics	3, 4, 5	4	Credit for ECON 002	Credit for ECON 002	Credit for ECON 002
• Microeconomics	3, 4, 5	4	Credit for ECON 003	Credit for ECON 003	Credit for ECON 003
English[1]					
• Language/Composition	3	4	Credit for ENGL 001A	Credit for ENGL 001A	Credit for ENGL 001A
		4	Elective (or 8 elective units if the student enrolls in ENGL 001A)	Elective (or 8 elective units if the student enrolls in ENGL 001A)	Elective (or 8 elective units if the student enrolls in ENGL 001A)
	4, 5	4	Credit for ENGL 001A	Credit for ENGL 001A	Credit for ENGL 001A
		4	Credit for ENGL 001B	Credit for ENGL 001B	Credit for ENGL 001B
• Literature/Composition	3	4	Credit for ENGL 001A	Credit for ENGL 001A	Credit for ENGL 001A
		4	Elective (or 8 elective units if the student enrolls in ENGL 001A)	Elective (or 8 elective units if the student enrolls in ENGL 001A)	Elective (or 8 elective units if the student enrolls in ENGL 001A)
	4, 5	4	Credit for ENGL 001A	Credit for ENGL 001A	Credit for ENGL 001A
		4	Credit for ENGL 001B	Credit for ENGL 001B	Credit for ENGL 001B
Environmental Science	4, 5	4	Credit for ENSC 001	Credit for ENSC 001	Credit for ENSC 001

[1]Maximum credit 8 units
[2]Maximum credit 4 units
[3]No longer offered

See "Programs and Courses" for subject abbreviations

College Board Advanced Placement Examination Credit

AP Examination	AP Score	Unit Credit	Bourns College of Engineering	College of Humanities, Arts and Social Sciences/School of Business/School of Education/School of Public Policy	College of Natural and Agricultural Sciences
French					
• Language & Culture	3, 4	8	Elective	Elective	Elective
	5	4	"Additional Humanities" breadth		
		4	Elective		
• Literature[3]	3, 4, 5	4	Humanities (Literature) breadth	Humanities (Literature) breadth	Humanities (Literature) breadth
		4	Elective	Elective	Elective
German					
• Language & Culture	3, 4	8	Elective	Elective	Elective
	5	4	"Additional Humanities" breadth		
		4	Elective		
• Literature[3]	3, 4, 5	4	Elective	Humanities (Literature) breadth	Humanities (Literature) breadth
		4	Elective	Elective	Elective
Government and Politics					
• United States Government	3, 4, 5	4	Credit for POSC 010	Credit for POSC 010	Credit for POSC 010
• Comparative Government	3, 4, 5	4	Credit for POSC 015	Credit for POSC 015	Credit for POSC 015
History					
• United States	3, 4, 5	4	Credit for HIST 017A	Credit for HIST 017A	Credit for HIST 017A
		4	Credit for HIST 017B	Credit for HIST 017B	Credit for HIST 017B
• European	3, 4, 5	4	Humanities breadth	Credit for HIST 052	Credit for HIST 052
		4	Elective	Elective	Elective
• World	3, 4, 5	4	Humanities (World History) breadth	Humanities (World History) breadth	Humanities (World History) breadth
		4	Elective	Elective	Elective
Human Geography	3, 4, 5	4	Social Science (Geography) breadth	Social Science (Geography) breadth	Social Science (Geography) breadth
Italian Language and Culture	3, 4	8	Elective	Elective	Elective
	5	4	"Additional Humanities" breadth		
		4	Elective		
Japanese Language and Culture	3, 4	8	Elective	Elective	Elective
	5	4	"Additional Humanities" breadth		
		4	Elective		
Latin					
• Latin	3, 4	8	Elective	Elective	Elective
	5	4	"Additional Humanities" breadth		
		4	Elective		
• Literature[3]	3, 4, 5	4	Humanities (Literature) breadth	Humanities (Literature) breadth	Humanities (Literature) breadth
Mathematics[1]					
• AB Examination	3, 4, 5	4	Credit for MATH 009A or MATH 007A	Credit for MATH 009A or MATH 007A	Credit for MATH 009A or MATH 007A
• BC Examination (ALL Schools/Colleges)	3	4	Credit for MATH 009A or MATH 007A	Credit for MATH 009A or MATH 007A	Credit for MATH 009A or MATH 007A
		4	Credit for MATH 009B or MATH 007B	Credit for MATH 009B or MATH 007B	Credit for MATH 009B or MATH 007B
	4, 5	4	Credit for MATH 009A or MATH 007A	Credit for MATH 009A or MATH 007A	Credit for MATH 009A or MATH 007A
		2	Credit for MATH 009B or MATH 007B	Credit for MATH 009B or MATH 007B	Credit for MATH 009B or MATH 007B
		2	Credit for MATH 009C	Credit for MATH 009C	Credit for MATH 009C
• AB Subscore (from BC examination)	3, 4, 5	4	Credit for MATH 009A or MATH 007A	Credit for MATH 009A or MATH 007A	Credit for MATH 009A or MATH 007A
Music					
• Theory	3, 4, 5	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth
		4	Elective	Elective	Elective
• Listen and Literature[3]	3, 4, 5	4	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth	Humanities (Fine Arts) breadth

[1]Maximum credit 8 units
[2]Maximum credit 4 units
[3]No longer offered

See "Programs and Courses" for subject abbreviations

College Board Advanced Placement Examination Credit

AP Examination	AP Score	Unit Credit	Bourns College of Engineering	College of Humanities, Arts and Social Sciences/School of Business/School of Education/School of Public Policy	College of Natural and Agricultural Sciences
Physics[1]					
• Examination B[3]	3, 4, 5	4	Elective	Natural Sciences and Mathematics (Physical Sciences) breadth	Elective
		4	Elective	Elective	Elective
• Examination C: Mechanics	3	4	Elective	Natural Sciences and Mathematics (Physical Sciences) breadth	Elective
	4, 5	4	Credit for PHYS 002A	Credit for PHYS 002A	Credit for PHYS 002A
• Examination C: Electricity and Magnetism	3, 4, 5	4	Elective	Natural Sciences and Mathematics (Physical Sciences) breadth	Elective
• Physics 1	3, 4, 5	4	Elective	Natural Sciences and Mathematics (Physical Sciences) breadth	Elective
		4	Elective	Elective	Elective
• Physics 2	3, 4, 5	4	Elective	Natural Sciences and Mathematics (Physical Sciences) breadth	Elective
		4	Elective	Elective	Elective
Psychology	3	4	Social Sciences (Psychology) breadth	Social Sciences (Psychology) breadth	Social Sciences (Psychology) breadth
	4, 5	4	Credit for PSYC 002	Credit for PSYC 002	Credit for PSYC 002
Spanish					
• Language & Culture	3, 4	8	Elective	Elective	Elective
	5	4	"Additional Humanities" breadth		
		4	Elective		
• Literature & Culture	3, 4, 5	4	Humanities (Literature) breadth	Humanities (Literature) breadth	Humanities (Literature) breadth
		4	Elective	Elective	Elective
Statistics	3	4	Credit for STAT 004	Credit for STAT 004	Credit for STAT 004
	4, 5	4	Credit for STAT 008 or STAT 010	Credit for STAT 008 or STAT 010	Credit for STAT 008 or STAT 010

[1]Maximum credit 8 units
[2]Maximum credit 4 units
[3]No longer offered.
[4]Maximum credit 4 units for AB examination and AB Subscore examination

See "Programs and Courses" for subject abbreviations



FINANCES AND REGISTRATION

Fees and Expenses

Student expenses depend upon a great many factors that should be considered carefully before planning a budget. Financial help needed — beyond funds that students or their families are able to provide — should be determined well in advance of the entering quarter. Use the charts in this section as guides to planning and visit finaid.ucr.edu for detailed information on costs to attend UCR.

Residency Classification

The University of California (UC) is a public university, and charges different tuition for resident (in-state) and nonresident (out-of-state) students. This means that UC has to decide which level of tuition will be charged for each student. For many students — both resident (in-state) and nonresident (out-of-state) — this is simple. However, for some students with more complex circumstances, this determination may require additional steps.

After you've been admitted, UCR determines if you're a California resident for tuition purposes—that is, whether you qualify for resident or nonresident tuition. The term "California resident for purposes of tuition" is different from other definitions of California residence. For example, a person who is a California resident for tax or voting purposes is not necessarily a resident for purposes of tuition at the UC. The UC has four residency requirements: 1) Physical presence 2) Intent to remain in California 3) Financial independence 4) Immigration status. More information on the UC residency requirements can be found at ucop.edu/residency.

The definition of residency may vary by office. If determined to be a resident by Admissions and/or Financial Aid, it is not a guarantee that you are a resident for tuition purposes. In order to determine your residency for tuition purposes, all new students must complete a Statement of Legal Residence (slr.ucr.edu). This form is completed online after committing to UCR by filing your Statement of Intent to Register (SIR). The Statement of Legal Residence must be completed no later than the residence determination date, or the start of instruction for the student's first term. Students will be charged nonresident supplemental tuition (NRST) until they are determined to be a resident for tuition purposes or exempt from NRST and should therefore complete their SLR as soon after completing their SIR as possible. Tuition will not be adjusted for forms completed once a term has ended. Residency for tuition purposes is decided by the campus residence deputy. If appealed, the information is reviewed by a UCR Appeals Committee, and UC Office of General Council when necessary. In certain cases, a student is classified as a nonresident, but will not be charged nonresident supplemental tuition. More information regarding exemptions, waivers, and the UC residency determination process can be found at ucop.edu/residency.

Tuition Administrative Processing Fee

Tuition Administrative Processing Fees are assessed to students who fail to make their tuition payment by the published payment due date and after an additional 5-business day grace period. In certain circumstances, the Tuition Administrative Processing Fees may be waived ONLY for the following reasons: physician verified student health condition, death in the family, or a verified administrative error on the part of the university.

Fee Exemptions

Dependents of Veterans

The California Education Code provides for exemption from certain fees at state-owned colleges, universities, and other schools for eligible students who are dependents or spouses of veterans whose death or disability was service connected. Qualifying UCR students are eligible for exemption from the Student Services Fee, tuition, and Professional Degree Supplemental Tuition. Claims for fee exemptions must be presented to the university during the academic year for which the claim applies. Retroactive approval can be granted only in situations in which students applied for the exemption in a timely manner but approval was delayed by the U.S. Department of Veterans Affairs processing of an original or reopened service-connected disability compensation or Dependency and Indemnity Compensation claim. Contact the Financial Aid Office, 2106 Student Services Building, (951) 827-3878, for information.

Tuition Stability Plan

Beginning fall 2022, tuition will be adjusted for each incoming undergraduate class but will subsequently remain flat until the student graduates, for up to six years. For undergraduates who first enrolled in fall 2021 or earlier—tuition will remain at the fall 2021 rates for up to six years. The plan will be up for reauthorization by the Board of Regents in five years.

Required Student Tuition and Fees

Fall Quarter 2025

For detailed information on fees, visit registrar.ucr.edu/tuition-fees

Undergraduate Students	Resident	Nonresident
Student Services Fee	$440.00	$440.00
Tuition	4,534.00	4,534.00
Health Insurance Premium	868.50	868.50
Recreation Center Fee	20.00	20.00
Recreation Expansion Fee	149.00	149.00
Division I Fee	35.00	35.00
Student Center Fee	90.00	90.00
ASUCR Fee	12.50	12.50
ASPB Fee	40.00	40.00
UCR Student Services Fee	6.00	6.00
KUCR Fee	3.00	3.00
Highlander Fee	3.50	3.50
Highlander Empowerment Student Services Fee	16.00	16.00
EOP Fee	1.50	1.50
Student Voice Initiative	1.33	1.33
Subsidized Student Admission Plan	2.50	2.50
UC Student Association Fee (UCSA)[1]	3.00	3.00
Green Campus Action Plan	2.50	2.50
Basic Needs and Aid Fee	5.00	5.00
Highlander Abroad Fee	2.00	2.00
Total—California Residents	**$6,239.33**	
Nonresident supplemental tuition		12,534.00
Total—Nonresidents		**$18,773.33**

Graduate Students	Resident	Nonresident
Student Services Fee	$430.00	$430.00
Tuition	4,380.00	4,380.00
Graduate and Professional Student Health Insurance Premium	1,859.26	1,859.26
Recreation Center Fee	20.00	20.00
Recreation Expansion Fee	149.00	149.00
Student Center Fee	90.00	90.00
Graduate Student Association Fee	13.57	13.57
Graduate Student Association Conference Travel	20.00	20.00
UCR Student Services Fee	6.00	6.00
UC Graduate and Professional Association Fee (UCGPC)[1]	3.00	3.00
Total—California Residents	**$6,970.83**	
Nonresident supplemental tuition		5,034.00
Total—Nonresidents		**$12,004.83**

Note: Students in the MBA, MPP, and MD programs pay Professional Degree Supplemental Tuition. Additional mandatory fees such as the Professional Degree Supplemental Tuition and the Medical School Disability Insurance Fee are assessed to all medical school students. Visit registrar.ucr.edu for more information.

Totals do not include the Technology Course Materials Fee of $70.00 per quarter for graduate students and $110.00 per quarter for undergraduate students.

Some or all instruction for all or part of Academic Year 2025-26 may be delivered remotely. Tuition and mandatory fees have been set regardless of the method of instruction and will not be refunded in the event instruction occurs remotely for any part of the Academic Year.

The amounts shown in this document represent fees as currently approved. However, all University fees are subject to change, and the fee amounts billed for this period may be adjusted at a future date.

[1]UCSA and UCGPC Fee: ($3.00 Fall • $2.00 Winter • $2.00 Spring)

Exemption from Nonresident Supplemental Tuition
Some students may be eligible for exemption from nonresident supplemental tuition. **See the section called Residency for Tuition Purposes on page 53 for more information.**

Fee Reductions

Employees
A regular status employee who meets the admission requirements of the university is eligible for a two-thirds reduction of both the Student Services Fee and tuition for up to 9 units or three regular-session university courses per quarter or semester, whichever is greater. An employee so registered is ineligible for the services and facilities of the counseling center, gymnasiums, or the student health services, other than those to which the employee may be otherwise entitled.

Doctoral Students Advanced to Candidacy
Students who are considered nonresidents for tuition purposes and are advanced to candidacy for the Ph.D. receive a reduction of 100% of the nonresident supplemental tuition. Students are eligible for a maximum of three calendar years. Time spent not registered (withdrawn, on leave, or on filing fee status) counts toward the three-year total unless the graduate dean grants an exception. Students must be advanced by the first day of instruction to qualify for that term.

Deferred Payment Plan

The Deferred Payment Plan (DPP) offers students an opportunity to pay their quarterly fees and tuition in three monthly installments. For each quarter of participation, a new application must be submitted through **rweb.ucr.edu**, with a non-refundable processing fee. Visit **sbs.ucr.edu/student-services#payment_options** for more information.

Refunds

Students who withdraw from all courses before the end of a quarter may be eligible to receive refunds for some fees. Go to **registrar.ucr.edu** for more information on the refund schedule. A withdrawal petition must be obtained from **myforms.ucr.edu** or from the Graduate Division. In accordance with federal regulations, refunds to financial aid recipients are first applied to repayment of aid disbursed.

The effective date for determining a refund of fees is the date the student files an official notice of withdrawal with the university. It is presumed that no university services will be provided to the student after that date.

Beginning the second day of instruction, the Student Services Fee, tuition, UCR campus fees, Professional Degree Supplemental Tuition, and nonresident supplemental tuition are refunded on a prorated basis.

Course Material Fees, Student Technology Fees, and the Single Document Fee are not refundable after the end of the add/drop period.

Refunds for health insurance vary. Consult the Student Health Services, Veitch Student Center, (951) 827-5683.

The Medical School Disability Insurance Fee is not refunded unless the student requests a prorated refund when withdrawing from UCR. Consult the School of Medicine at (951) 827-4333 for information about the refund of insurance benefits after withdrawal.

Self-supporting programs may have different refund policies. To learn more go to **registrar.ucr.edu** for published refund policies.

For details concerning fees and fee refunds, consult Fees and Enrollment at **ucop.edu/operating-budget/**.



Refunds for New Students Receiving Federal Financial Aid

Fee refunds for new students receiving Title IV federal financial aid are as follows:

Prior To and Including Day 1
Prior to and including the first day of instruction, the Student Services Fee is refunded except for the $250 Statement of Intent to Register deposit paid by undergraduates. Other eligible fees paid are refunded in full.

Day 2 and After
Beginning the second day of instruction, the Student Services Fee is refunded on a prorated basis except for the $250 Statement of Intent to Register deposit. Refunds of other eligible fees are prorated as shown in the Schedule of Refunds on **registrar.ucr.edu**.

New students receiving Title IV federal financial aid who withdraw during their first quarter at UCR receive a prorated refund if they withdraw by the end of the sixth week of the quarter.

Refunds for All Other Students

Refunds for all continuing and readmitted students are as follows:

Prior To and Including Day 1
Prior to and including the first day of instruction, eligible fees paid are refunded in full.

Day 2 and After
Beginning the second day of instruction, a prorated refund is given for eligible fees paid. Please see **registrar.ucr.edu** for details.

If students withdraw during a quarter, federal regulations require UCR to calculate the amount of federal financial aid that has been "earned" for the period they attended. If they withdraw before completing 60 percent of the quarter, a pro rata portion of the aid must be returned to the federal government. Any portion of unearned aid that must be returned to federal aid programs by UCR will be deducted from the amount of the tuition and fee and/or housing refund. If the amount UCR must return to federal aid programs exceeds the amount of the student's institutional refund, the
student's account may be billed. More information regarding the return of Title IV federal aid requirements is available at **finaid.ucr.edu**.

Distribution Formula for Institutional Refunds

If a Housing or Registration refund is due to a student under UCR's refund policy and the student received financial aid under any aid program other than Federal Work-Study, the refund shall be returned to student assistance programs in the following order: outstanding balances on Federal Direct Unsubsidized Loan, Federal Direct Loan, Federal Direct PLUS Loan, Federal Pell Grant, Federal Supplemental Educational Opportunity Grant, Cal Grant A or B, Middle Class Scholarship, Grant-in-Aid State, other institutional grants or scholarships. The portion of a refund allocated to a program may not exceed the amount a student received from that program.

Financial Support

Financial Aid Office
2106 Student Services Building
(951) 827-3878;
finaid@ucr.edu; financialaid.ucr.edu

The Financial Aid Office assists students with meeting educational expenses that cannot be met from personal resources. To obtain financial aid students must file the Free Application for Federal Student Aid (FAFSA) with the Financial Aid Office yearly. FAFSAs are available online beginning mid December for the upcoming academic year at studentaid.gov/h/apply-for-aid/fafsa. Undocumented students who meet the California high school attendance and graduation requirements of state law AB540 who are ineligible to file the FAFSA should complete the California Dream Application available online at dream.csac.ca.gov. See chart for deadlines for financial aid.

Students applying for other grants, loans, and work-study should apply as early as possible. Applications are accepted year-round, with awards to late applicants based on fund availability. Funding cannot be guaranteed to students whose FAFSA or Dream Applications are submitted after March 2.

An analysis of the FAFSA or Dream Application is required to determine the amount that a student's parents, the student, and/or the student's spouse can be expected to contribute toward the cost of the student's education. The university expects the student and parent (if the student is dependent), or spouse (if the student is married), to contribute toward the educational costs to every extent possible. In addition to filing the FAFSA or Dream Application, applicants for financial aid may also be required to submit supporting materials (such as income tax transcripts) that the Financial Aid Office uses to determine each student's financial need.

Financial Aid Deadlines

Students submit *FAFSA* or *Dream Application* for the upcoming year	**March 2**
New Cal Grant applicants submit *GPA Verification Form* to California Aid Commission	**March 2**
Scholarships	
Entering students apply with the Application for *Undergraduate Admission and Scholarships*	**November 30**

All undergraduate financial aid applicants must also apply for California State Grants (Cal Grant A and/or B) by completing the FAFSA or Dream Application, and GPA Verification Form and submitting them by the March 2 filing deadline. If the California Student Aid Commission determines that a student is ineligible for a Cal Grant A or B award, the grant may be replaced with a Federal Direct Loan in the financial aid package from UCR.

In order to maintain eligibility to receive financial aid, students must re-apply every year, meet all posted deadlines, enroll in sufficient units, not default on any federal loans or owe repayments on any federal grants, clear all holds, and make satisfactory academic progress. More information on eligibility requirements is available on the UCR Financial Aid website at financialaid.ucr.edu/apply/stay-eligible.

International students are expected to have the necessary funds to cover their entire period of study. The Financial Aid Office does not have funds available to offer assistance to international students. Assistance is not available to students on "limited" status or to those enrolled in UCR Extension. An exception is made for students admitted on "limited" status who must take required prerequisite course work for full admission into the Graduate Division. Students who fall into this category must submit documentation from the Graduate Admissions Office confirming that they are taking prerequisite course work for graduate admission.

For information on graduate student support, see Financial Support under Graduate Studies in this catalog.

Grants, Loans, Employment, and Scholarships

Students who receive financial aid may receive funds from one or more of the following sources: grants, loans, employment, and scholarships. These sources are described briefly in the following sections; more detailed information regarding eligibility criteria, fund disbursement rules, and enrollment requirements can be obtained from the Financial Aid Office and on the financial aid website at finaid.ucr.edu.

Veterans Affairs Benefits

School Certifying Official
Highlander One Stop Shop, Student Services Building
(951) 827-4921;
vasco@ucr.edu; financialaid.ucr.edu

The Financial Aid office hosts the School Certifying Official, who is the liaison to the U.S. Department of Veterans Affairs (VA) for students who are eligible for VA educational benefits as a result of their own military service or that of a parent or spouse. It's the student's responsibility to report to Financial Aid any change in status that may affect benefits. The Certifying Official can be directly contacted at vasco@ucr.edu.

Children and spouses or registered domestic partners of veterans whose death or disability (at any percentage) was service-connected may also be eligible for exemption from most university fees under provisions of the California Educational Code. Application may be made to any California county veterans services office. Claims or fee exemptions should be presented to the university during the academic year for which the claim applies. Retroactive approval can be granted only in situations in which students applied for the exemption in a timely manner but approval was delayed by the VA's processing of an original or reopened service-connected disability compensation or Dependency and Indemnity Compensation claim; a copy of the initial denial letter from the California Department of Veterans Affairs or county services office is required to document such circumstances.

Grants

The **Federal Pell Grant** program is federally funded and may provide awards up to a maximum of $7,395 for the academic year. To be eligible, an applicant must be a U.S. citizen or eligible noncitizen, must be enrolled as an undergraduate, and must not have previously received a bachelor's degree. An exception is available for eligible students enrolled in the teaching credential program in the School of Education. Students apply for the Pell Grant by filling out the 2025-2026 FAFSA.

Federal Supplemental Education Opportunity Grants are federally funded, need-based grants available only to U.S. citizens and eligible noncitizen undergraduate students who have not previously received a bachelor's degree. The grants range from $100 to $4,000 per year.

The State of California–Cal Grant A and B Program
The Cal Grant A program provides awards ranging from $100 to $14,934 for the academic year. To be eligible, new applicants must be California residents. Awards are based on academic achievement and financial need. The Cal Grant B program provides awards ranging from $100 to $16,582. To be eligible, applicants must be California residents and must demonstrate financial need. The awards are for students from disadvantaged families.

Middle Class Scholarships (MCS) are awarded by the California Student Aid Commission to on-time FAFSA or DREAM Applicants undergraduates and teaching credential students who are California residents or eligible for AB540 nonresident tuition exemptions to students who meet MCS income and asset ceilings. In order to ensure consideration for the MCS award, students must complete a Free Application for Federal Student Aid (FAFSA) or the California Dream Act Application by March 2nd each year. MCS amounts are tiered based on family income and are calculated by the California Student Aid Commission. Final amounts are determined after all Federal, State, Institutional or outside scholarship aid is finalized and may differ from initial estimates based on changes in the student's cost of attendance, grant and scholarship awards, number of terms enrolled in the award year, enrollment on a less than full time basis, change in residency status, and/or state appropriation amounts. MCS award amounts may be reduced at any time during the academic year if a recipient receives any additional federal, state, institutional or private funding after the MCS has already been awarded.

UCR Grant awards are offered to undergraduates with the greatest financial need whenever guidelines and funding levels permit.

The **USHIP Fee Grants** are offered to eligible undergraduate students who meet all financial aid deadlines and financial eligibility requirements to help cover the cost of undergraduate student health insurance fees. Students who elect to waive USHIP fees are not eligible to receive the USHIP Fee Grant.

Loans

Normally, one or more types of loans are included in each combination of aid offered to a student. Borrowers must be aware of their repayment obligations.

Federal Direct Loans are available to both undergraduate and graduate students who are U.S. citizens or eligible noncitizens. The maximum amount that may be borrowed under this program is $3500 per year for students in their first year of undergraduate study (0–44 quarter units), $4,500 per year for the second year of undergraduate study (45–89 quarter units), and $5,500 per year after reaching junior status (90 or more quarter units), up to an aggregate undergraduate maximum of $23,000. Teaching credential students are limited to the $5,500 annual maximum for fifth year undergraduate students according to federal regulations. Graduate students are not eligible for subsidized loans.

In addition to these amounts, under the **Federal Direct Unsubsidized Loan Program** dependent students may borrow up to $2,000 per year, and independent students may borrow $6,000 for the first or second year of undergraduate study (0–89 quarter units), or $7,000 for the third or fourth year of undergraduate study (90 or more quarter units), or $7000 for teaching credential study, and $20,500 for graduate study. Interest on a Federal Direct Unsubsidized Loan accrues immediately and must be paid while in school or added back to the principal amount borrowed.

Dependent undergraduate students may borrow an aggregate of $31,000 in combined Federal Direct Subsidized and Unsubsidized Loans, of which no more than $23,000 can be from Subsidized Loans. Independent undergraduate and teaching credential students may borrow an aggregate of $57,500 in combined Federal Direct Subsidized and Unsubsidized loans of which no more than $23,000 can be from Subsidized Loans, and graduate students may borrow a combined aggregate maximum of $13,500, including amounts borrowed as undergraduates.

An origination fee of 1.057% is deducted from your loan before the funds are sent to your school. For loans taken out for the 2025-2026 school year, undergraduate students receive a 6.39% interest rate and graduate students receive a 7.94% interest rate. Interest rates will be set annually for new loans and are subject to change. Minimum monthly repayment of $50 per month begins 6 months after students cease to be enrolled at least half-time. Borrowers can choose a repayment plan based on their financial circumstances with repayment periods ranging from up to 10 years for standard fixed monthly repayment, to up to a period of 12 to 30 years under alternate repayment options. Information on repayment plans is available at **https://studentaid.gov/manage-loans/repayment**.

Graduate students may borrow **Federal Grad PLUS Loans** for up to the annual cost of education minus any estimated financial aid received. An origination fee of 4.228% is deducted from the loan prior to disbursement. For Direct PLUS Loans first disburse on or after July 1, 2025 and before July 1, 2026, the interest rate is 8.94%. This is a fixed interest rate for the life of the loan, which begins accrual immediately upon disbursement. The terms, including the six-month grace period, are otherwise the same as for Unsubsidized Loans.

Parents may borrow up to the annual cost of education minus any estimated financial aid received by the student from Federal Direct PLUS Loans (Parent Loans), regardless of financial need. A FAFSA application must be submitted for this loan. New parent borrowers awarded the PLUS loan will be instructed to complete a PLUS Loan Request form online, then a separate online loan promissory note. The application approval process includes a standard credit check for all parent borrowers. An origination fee of 4.228% is deducted from the amount of the loan prior to disbursement. For Direct PLUS Loans first disburse on or after July 1, 2025, and before July 1, 2026, the interest rate is 8.94%. This is a fixed interest rate for the life of the loan, which begins accrual immediately upon disbursement. Interest begins accruing on the PLUS loan after the first disbursement. The first payment of principal and interest is due approximately 60 days after the final loan disbursement for the year is made, but may be deferred while the student is enrolled.

DREAM Loans are available to undocumented AB540 undergraduate and graduate students. Applicants must complete a California Dream Application. The amount a student may borrow is determined by the Financial Aid Office based on annual allocations. Interest rates are subject to change annually and are the same as those for the Federal Direct Subsidized Loan program (6.39% for loans disbursed on or after July 1, 2025 for the 2025-2026 academic year).

University Loans are offered to eligible undergraduate students by the campus to pay for the annual cost of attendance, less any financial aid received. The University Loan has a 5% fixed interest rate. Repayment begins 9 months after full-time or half-time enrollment ends

Emergency Student Loan Fund
In addition to the long-term loans from financial aid programs mentioned above, UCR has an emergency student loan fund. This loan, which does not bear interest, is of a short-term nature to cover emergency needs of up to $500. Students may borrow up to three times a year.

Employment

Federal Work-Study is awarded to students with demonstrated financial need. Work-study awards enable students to reduce the amount of loan indebtedness they may incur while attending the university.

Various work opportunities are available through the UCR Career Center, online at **careers.ucr.edu**, in either on-campus or off-campus jobs at nonprofit and community services agencies.

Scholarships

Scholarship awards are based on a student's academic achievements and, except for honorary scholarships, on need. Scholarships are considered gift assistance.

Most scholarships available through the Financial Aid Office are based on financial need. Other undergraduate scholarships are offered to entering and continuing undergraduates who show evidence of high scholastic attainment. Applicants must meet all priority deadlines for consideration. Non-need based scholarship awards, including Alumni Scholarships, are available to undergraduate students. Financial need is not required.

Regents Scholarship, one of the highest honors conferred upon UC students, is awarded on the basis of academic excellence and exceptional promise, without reference to financial need. Students are eligible upon graduation from high school. The appointments run for four years for students entering from high school. Regents Scholars receive an honorarium each year of appointment.

Regents Transfer Scholarship, a renewable award offered to incoming transfer students with a transfer GPA of 3.95 or above who have financial need.

Chancellor's Scholarship, an award offered to incoming first year undergraduate students with a distinguished high school academic record. The scholarship provides an honorarium applied toward student fees. More information regarding the terms of the scholarship award and the amount of the honorarium are available on the Chancellor's Scholarship Terms that the recipient accepts on MyUCR when offered this award.

Chancellor's Performance Awards
Information on Chancellor's Performance Awards may be obtained from the departments of Art, Creative Writing, Dance, Music, and Theatre, Film and Digital Production.

UCR Achievement Scholarship, an award offered to incoming first year and transfer recipients must be classified as a Non-Resident student as determined by the University for purposes of assessing tuition charges. The UCR Achievement Scholarship is designated to pay non-resident tuition. Should a recipient receive another source that is specifically for non-resident tuition (i.e. a non-resident tuition waiver or a non-resident scholarship), the UCR Achievement Scholarship will be cancelled. UCR Achievement Scholarship recipients are required to enroll full time in a minimum of 12 units to receive their scholarship disbursement per the eligibility provisions in the terms of their merit scholarship awards which they receive at the time of their initial offer.

Engineering Scholarships
Information on scholarships in Engineering may be obtained from the Bourns College of Engineering Student Affairs Office.

Natural and Agricultural Scholarships
Information on scholarships in the natural and agricultural sciences may be obtained from the College of Natural and Agricultural Sciences Student Affairs Office.

Departmental Scholarships
Some scholarships are available through academic departments. For more information, students should contact their department.

Graduate Fellowships and Assistantships
For information on graduate fellowships and assistantships refer to the Graduate Studies section of this catalog or contact the Graduate Division.

Undergraduate Research Grants
As a research university UCR encourages the tradition of student and faculty engagement in research. UCR provides grant support for students to deepen their knowledge and skills in cutting edge research, field work, and other creative activities under the close guidance of a faculty mentor. Student travel for the purpose of presenting research work at a scholarly conference is also supported through these funds. Grants are available on a quarterly basis. All awards support the costs of conducting a project and cannot be used as a student salary or scholarship aid. Student grant proposals may be initiated directly by students after approaching a faculty member for sponsorship or by faculty suggesting projects to undergraduates.

Student grant awards may be available from the student's department or college or through the Division of Undergraduate Education. For more information visit: ssp.ucr.edu.

Registration and Enrollment

Official registration consists of two steps.

1. Enrollment in classes
2. Payment of fees

Except where noted, the following information applies to both undergraduate and graduate students. Additional information concerning enrollment and academic policies applying only to graduate students is in the Graduate Studies section of this catalog. Additional detailed information related to registration and enrollment, including details about the following can be found at registrar.ucr.edu:

- Academic Calendar
- Classes, class hours and locations, and instructors
- Changing your class schedule
- Fees and paying fees
- Final exams
- Grades
- Graduation

Most enrollment and payment functions can be performed at rweb.ucr.edu.

You may also find additional information in the section titled Expected Progress.



Part-Time Study

Undergraduates
Part-time study (less than 12 units) is available to undergraduate students who find it difficult to enroll full-time because of health problems, family and home responsibilities, or occupational and financial need. Students enrolled in 10 units or less must submit a Part-Time Fee Waiver (registrar.ucr.edu/tuition-fees/waiver) by the published deadline in the Academic Calendar in order to receive the benefit of paying ½ tuition and ½ non-resident supplemental tuition (if applicable) for the requested quarter. Students submitting a Part-Time Fee Waiver are still required to pay the full Student Service Fees. **Requesting a Part-Time Fee Waiver may impact financial aid.** All students interested in attending part-time should discuss their plans with their Academic Advisor who must approve the form, and the Financial Aid Office (if applicable). Please note: A student who does not complete a Part-Time Fee Waiver form by the posted deadlines will be responsible for the full-time tuition rate, regardless of the number of registered units.

Graduates
In some programs, half-time study is possible for graduate students who for reasons of occupation (i.e., full-time employment), unusual family responsibilities, or health reasons are not able to attend full time. A half-time student may not enroll for more than 6 units at any level. Half-time for the Online Masters in Engineering is 5 units and for the Masters in Business Administration it is 8 units. Graduate students who are approved for this program receive a refund of one-half of the tuition, one-half of the nonresident supplemental tuition (if applicable), and one-half of the Professional Degree Supplemental Tuition (if applicable). For further details and an application, contact the Graduate Division.

Concurrent Enrollment Options

UCR credit for any course taken at another college institution (including UCR Extension) while the student is in residence at UCR is called credit from concurrent enrollment. Credit is normally awarded only under unusual circumstances or through the Cross Registration Program described below during the regular academic year and only with prior approval of the associate dean of the UCR college in which the student is enrolled.

UCR Extension students taking regular-session UCR courses through concurrent enrollment may receive grade points as well as unit credit (effective Spring 1999) should they continue in or be subsequently admitted or readmitted to regular UCR student status. A transcript of the work must be submitted to the Office of Undergraduate Admissions.

Courses taken elsewhere during the summer by a UCR student do not require that the student be under extraordinary circumstances, but they do require prior approval to receive UCR credit even if the student is not in residence at UCR during that summer.

Regular Summer Sessions courses taken at UCR are credited automatically to the UCR academic record of any student enrolled in the regular academic year.

Cross Enrollment

Senate Bill 1914 (Killea)
The California Education Code Sections 66750 through 66756, commonly referred to as Senate Bill 1914 (Killea), permits undergraduate students enrolled in any campus of the California Community Colleges, the California State University, or the UC to enroll without formal admission in a maximum of one course per academic term at a campus of either of the other systems on a space-available basis at the discretion of the appropriate campus authorities on both campuses. At UC campuses, the beginning of the third week of instruction has been designated as the date by which an instructor can determine when space is available to accommodate a student seeking to enroll on this basis. (Normally, instructors in all segments permit students to attend classes until their final course registration has been certified.) Killea does not allow enrollment at another campus within the same system. Students who seek to cross enroll under this program must have met all of the following requirements:

1. Completed at least one term at their home campus as a matriculated student
2. Enrolled for a minimum of six units at their home campus for the current term
3. Earned a cumulative grade point average of 2.00
4. Paid appropriate fees and any applicable tuition at their home campus for the current term

5. Completed appropriate academic preparation for the desired course, as determined by the host campus, consistent with the standards applied to regularly enrolled students
6. Have been classified as a California resident by their home campus

Both schools must be participating in this program before a student can take a course at another institution for the $46 per unit cross enrollment fee. Additional information and cross enrollment application forms are available at the Office of the Registrar.

CSUSB Cross Registration Program
The Cross Registration Program allows a full-time UCR undergraduate student who has officially declared a major and who is in good academic standing to enroll simultaneously at California State University, San Bernardino for no more than one course per quarter. The program is designed for students to take classes not available at UCR. (This program is not available during Summer Session.) Approvals are required from the student's academic advisor, college dean, and the Registrar. Application forms and deadline information may be obtained from the Office of the Registrar.

Simultaneous Enrollment
Simultaneous Enrollment is similar to the Intercampus Visitor Program, but participants are enrolled in at least six units at UCR while simultaneously taking additional classes at another UC campus. Program participants are able to take these classes without needing to be formally admitted to the host campus, and the cost of these units is covered by your UCR tuition. Specific course materials may still apply – please contact the host campus for additional information. Please note that the Simultanious Enrollment program is not available during Summer session.

Eligibility requirements:
- Has completed a minimum of 12 units as a matriculated student at UCR (home campus).
- Is enrolled for a minimum of 6 units for the current term at UCR (home campus)
- Is in good standing.
- Has the appropriate academic preparation as determined by the host campus.
- Must have fees paid by Fee Payment deadline

Steps for Process:
- Forms of Simultaneous Enrollment can be obtained by emailing **reghelpdesk@ucr.edu**.
- Once complete, submit the completed form to **reghelpdesk@ucr.edu**.
- After submission, the completed application will be reviewed by the Registrar's Office and submitted to the corresponding host campus for approval on behalf of the student. If approved, communication will be shared by the host campus on how to access course content. If denied, communication will be shared by the home campus to the student.

For additional information and application for Simultaneous Enrollment, please contact the Registrar's Office at (951) 827-7284 or email **reghelpdesk@ucr.edu**.

UC Online

UC Online Enrollment allows participants to take online courses offered by another UC campus. Program participants can take these classes without being formally admissed to the host campus, and the cost of these units is covered by your UCR tuition. For additional information and to enroll in UC Online opportunities, please visit **uconline.edu**.

Please note: UC Online is not available during the Summer session. Students are also encouraged to speak with Academic Advising to confirm eligibility requirements.

Eligibility requirements:
- Competed at least 12 units as a matriculated sutdnet at UCR (home campus).
- Enrolled in a minimum of 6 units for the current term at UCR (home campus).
- In good standing.
- Has the appropriate academic preparation as determined by the host campus.
- Must have fees paid by the fee payment deadline.

Steps for Process:
- You are encouraged to speak with your advisor before enrolling in UC Online courses to confirm you meet the requirements and ensure your desired courses will meet degree requirements.
- Ensure you have not already met your unit maximum for enrollment for the term and that the desired UC Online course will not take you above your unit maximum.
- Ensure you do not request more than 2 UC Online courses.
- Go to **uconline.edu** and request enrollment into your desired course.
- Your request will be reviewed for approval.
- If approved, you will be enrolled in the Host Campus system for the course. You will see a placeholder course within your UCR registration.

For questions, please contact: **Reghelpdesk@ucr.edu**

Intercampus Visitor Program

The Intercampus Visitor Program enables qualified undergraduates at the UC to take advantage of educational opportunities at other UC campuses. Under this program, students may take courses that are not available on their home campus, participate in special programs, or study with a distinguished faculty member at another campus. Participants may enroll at another campus for only one term. Additional information on requirements and application forms can be obtained at the Registrar's website (**registrar.ucr.edu**). Intercampus visitors must apply for financial aid at their host campus and must be making satisfactory academic progress on their home campus to be eligible to be awarded.

Withdrawals and Leaves of Absence

Undergraduate students who wish to withdraw from all courses in the university during a current quarter, officially and without scholarship penalty, must initiate an application for withdrawal through **myforms.ucr.edu**. The student must settle all accounts and return any university property such as books, keys, laboratory equipment, and uniforms. After the first few weeks of the quarter, such petitions are granted only under exceptional circumstances.

Students who withdraw are no longer considered continuing students. Students wishing to return to the university must apply for readmission by the published deadlines. Visit **registrar.ucr.edu** for deadline information.

Students who do not officially withdraw from the university may receive grades of "F" in all courses in which they are enrolled. Further, the Financial Aid Office is required to notify the Department of Veterans Affairs when any student fails, receives no credit, or withdraws from all registered courses.

The Planned Educational Leave Program (PELP) is for undergraduate students who want to interrupt their regular education for one year or less while clarifying educational goals, gaining practical experience away from campus, or enhancing the prospect of successful completion of an academic program. Students must have completed at least one quarter of course work at UCR and be in good academic standing to qualify. Students holding F-1/J-1 visas must consult with an International Student Advisor before participating in this program. Information on PELP is available from the dean of the student's college, UCR Counseling and Psychological Services, and the Office of the Registrar.

Planned Opportunities Abroad Agreement (POAA) permits UCR students to Education Abroad on a non-UC program through the Opportunity Abroad Program (OAP) and return to UCR without having to file for readmission. Courses completed are subject to review for transferability. POAA advising and applications are available at the Education Abroad Programs, Student Services Building, Second Floor. **international.ucr.edu/abroad**.

Readmission

Undergraduate students who wish to return to UCR must file an application for readmission with their college Student Academic Affairs Office if they have withdrawn or if they have been away for more than 3 consecutive terms, not counting summer session. Visit registrar.ucr.edu for deadline information. A nonrefundable application fee of $70 is charged. Approval of the dean of the student's college or division is required for readmission. Students dismissed or not in good standing may be required to meet with the appropriate dean. Readmission of students disqualified for disciplinary purposes is subject to approval of the Dean of Students.

Transcripts from other institutions (including University Extension) attended during a student's absence must be filed with the Undergraduate Admissions Office at least six weeks prior to the quarter of readmission.

Graduate students desiring readmission or termination of leaves of absence should contact the Graduate Division.

Student Records and Transcripts

The Office of the Registrar prepares and permanently retains records of students' academic work at UCR for regular sessions and summer sessions. It maintains separate academic records for undergraduate, medical, and graduate levels, but sends all levels taken at UCR as one transcript. The academic record chronologically lists courses, units, grades, cumulative GPA, transfer credits, and total units.

Students may order copies of their transcript through rweb.ucr.edu. The online order includes the student's authorization of the release of the academic record. Rush service for the transcript is available for $10 and pick-up service is available for $20. Express mail service is available for an additional fee based on current Federal Express rates. For pricing and service options, please see registrar.ucr.edu. Payment, if applicable, is due in advance for all official transcripts.

Students are strongly advised to check their academic records carefully and to bring any discrepancies to the attention of the Office of the Registrar immediately. Supporting enrollment documents are retained for no more than one year. After one year, it is assumed that students accept the accuracy of their academic records. Once a degree has been posted, changes to a student's academic record are allowed only to correct an administrative error.

Degree Conferral

The culmination of the student's academic career is the conferral of degree on the official transcript. The graduation process is multi-step starting with the student applying to graduate at rweb.ucr.edu by the published deadline. Students must ensure all transfer work transcripts are submitted prior to the published deadline or the graduation application will be deferred to a future quarter. It is not recommended for students to study abroad in their final quarter, as receipt of grades may delay their conferral date to a future quarter. Student academic records are reviewed and approved by the academic college or school and the Registrar's Office. Degrees are traditionally conferred approximately 5 weeks after the end of the term. Diplomas are mailed directly to students who do not have a hold preventing its release. Details and deadlines can be found at registrar.ucr.edu.

Disclosure of Student Records

Pursuant to *UCR's Policies Applying to the Disclosure of Information from Student Records – Local Procedure* document, this is the annual notification of the Family Educational Rights and Privacy Act (FERPA). The UCR FERPA policy is located on the Office of the Registrar website.

FERPA affords eligible students certain rights with respect to their education records. (An "eligible student" under FERPA is a student who is 18 years of age or older or who attends a postsecondary institution at any age.) These rights include:

1. The right to inspect and review the student's education records within 45 days after the day the Registrar's Office at UCR, receives a request for access.
2. The right to request the amendment of the student's education records that the student believes is inaccurate, misleading, or otherwise in violation of the student's privacy rights under FERPA.

   A student who wishes to ask UCR to amend a record should write the Registrar, clearly identify the part of the record the student wants changed, and specify why it should be changed.
3. The right to provide written consent before UCR discloses personally identifiable information (PII) from the student's education records, except to the extent that FERPA authorizes disclosure without consent.

   Students provide access to their record in one of three ways:

   1. Customizing Directory Information through R'Web Self-Service
   2. Set up Authorized Users through R'Web Self-Service
   3. Use of Department-Specific Release Forms

   UCR discloses education records without a student's prior written consent under the FERPA exception for disclosure to school officials with legitimate educational interests. UCR defines "legitimate educational interest" as information relevant and necessary for a campus official to perform any of the following tasks:

   1. An employment responsibility or an assigned subject matter for the inquirer
   2. Participation in the student's education
   3. The discipline of a student
   4. Providing a service or benefit related to a student or student's family (such as health care, counseling, job placement, or financial aid)

   Upon request, the school also discloses education records without consent to officials of another school in which a student seeks or intends to enroll. Disclosure of Information from Student Records (130.720) within UCOP's Policies Applying to Campus Activities, Organizations and Students (PACAOS) provides further documentation on permissible disclosures without student consent.
4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the UCR to comply with the requirements of FERPA. The name and address of the office that administers FERPA is:

   Family Policy Compliance Office
   U.S. Department of Education
   400 Maryland Avenue, SW
   Washington, DC 20202

Students are encouraged to follow the UCR informal and formal grievance process by notifying the FERPA officer/Registrar with concerns of inappropriate disclosures.

The University of California, Riverside considers the following to be public information with respect to individual students: – Directory information includes: Student Name, Date of Birth, Place of Birth, E-mail address, Telephone Numbers, Field of Study (including major, minor, concentration, specialization, and similar designations), Dates of Attendance, Grade Level, Enrollment Status (e.g., full time or part time), Number of Units in which Enrolled, Degrees and Honors Received, Previous Educational Institution Attended, and Participation in Officially Recognized Activities, including, but not limited to, Intercollegiate Athletics; the name, weight, and height of participants in Intercollegiate UCR athletic teams.

Residency for Tuition Purposes

Residency Requirements and Classifications

A classification as resident, nonresident, or nonresident supplemental tuition exempt are dependent upon the student's circumstances.

All students are presumed to be dependent student which requires that parents must also satisfy all applicable residency requirements, until the student has been determined to qualify as an independent student as set forth below.

Resident Classification

To receive resident classification for UC tuition purposes, the student must be in an eligible immigration status, established a primary and permanent domicile in California for at least one year and one day prior to the residency determination date (RDD), fulfilled the physical presence and intent requirements; or, demonstrate eligibility for a Special Circumstances Resident Classification.

NRST Exempt Classification
To receive an NRST Exemption classification, a student must be eligible for, and have fulfilled all applicable requirements for the NRST Exempt classification. As NRST Exempt, the student is considered a nonresident, but exempt from the assessment of nonresident supplemental tuition.

Nonresident Classification
Nonresident classification is determined for students who do not meet the requirements as a California resident, NRST Exempt, or Special Circumstances Resident classification based on the student's circumstances.

International Student (F-1/J-1) Visa Holders
International students holding F-1 or J-1 visas are subject to nonresident tuition and are unable to gain California residency.

Principles Governing Residency Determinations
The Regents of the University of California confers the benefit of "resident tuition" to Students who have fulfilled the Residency Requirements established by Regents Policy 3105 as set forth in the UC Residence Policy and Guidelines ("RPG") herein.

Residency for purposes of UC tuition is specific to the University of California and separate from the California Community Colleges and California State University systems and may be different from residency for purposes of UC admission and other state rules or regulations governing residency for other purposes.

New Incoming and Transfer Students (includes UC Campus Transfers) will have their residency evaluated and may be asked to submit a Statement of Legal Residence (SLR) before initial enrollment at a UC campus. The Residence Deputy evaluates the SLR and supporting documentation and will determine a residency classification of resident, NRST Exempt, or nonresident. Failure to submit the SLR and all requested documentation by the published deadline will result in a residency classification based on the information provided to-date, which will often result in an undetermined status, resulting in nonresident tuition. All residency determinations, including nonresident are final.

Returning Students: Students returning after a leave of 3 or more terms must submit an SLR as determined per campus policy. A Student who fails to submit an SLR by the relevant deadline will not be entitled to retroactive reimbursement of NRST assessments.

Change in Residency Status: A student who has received a resident or NRST Exempt classification is required to notify the campus Residency Deputy within 30 days if they are no longer eligible as a resident or NRST Exempt classified student due to a change in student and/or parent circumstances (when applicable). The updated classification will become effective with the next academic term. Failure to notify the campus within 30 days may result in retroactive assessment of NRST.

Petition for Reclassification: A student who received nonresident classification will retain that status until the student files a Petition for Reclassification by the published deadline after meeting the requirements as either a California resident or NRST Exempt classification. A student who fails to file the petition is not entitled to retroactive reimbursement of NRST charges.

Inquiries regarding UC residency for purposes of tuition should be directed to a campus Residence Deputy in the campus Registrar's Office or to a Residency Analyst in the Office of the General Counsel of The Regents of the University of California, Office of the President. No other office, entity, or individual is authorized to provide residency information on behalf of the University of California.

PENALTY OF PERJURY
All statements and documents submitted to the University of California to support a residency classification for purposes of UC tuition are submitted under penalty of perjury under the laws of the State of California. The student, parents, or qualifying individual when applicable, are required to declare under oath, declaration or affidavit, that all statements and supporting documents are true and correct. Where a residency classification is found to be obtained based on concealed facts or untruthful statements, the University may:

- Bill the student for all tuition, NRST, and fees that would have been charged;
- Hold a student's registration until full payment of amount due is received;
- Hold diplomas until full payment of amount due is received;
- Notify appropriate regulatory agencies;
- Initiate discipline under Policy on Student Conduct and Discipline ("PACAOS 100"); and
- Pursue civil, criminal, or other remedies that may be appropriate.

The SLR must be signed, handwritten or electronically, by the student under penalty of perjury. A student must sign the SLR even if the student has yet to reach the age of majority; pursuant to State of California law, a minor may be prosecuted for perjury.

Compliance and Delegation
The UC Residence Policy and Guidelines ("RPG") is established by The Regents under Regents Policy 3105, approved May 24, 2018, effective with the 2019-20 Academic Year. The President, or designee, in consultation with the General Counsel, or designee, is authorized to adopt and amend implementing guidelines consistent with Regents Policy 3105. Accordingly, Students should review the RPG prior to applying for a residency classification to ensure compliance with the most recent requirements for the relevant academic term.

No Right of Action
This policy is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the University of California or its Board of Regents, individual Regents, officers, employee, or agents.

Appeals
Requirements to appeal of nonresident classification

The UC Office of General Counsel processes appeal applications for all UC campuses. A student may only appeal a campus nonresident classification if one or more of the following circumstances applies:

a. The nonresident classification decision was based on an error made by UC, including (a) a significant error of fact, or (b) a significant procedural error, or (c) an incorrect application of policy,

OR

b. The student received significant new information that (a) became available after the issue date of the campus nonresident classification, and (b) despite the exercise of reasonable diligence, the information was not previously known by or available to the student, which, if corrected, the nonresident classification is incorrect. Failure to respond to the campus or to provide requested information by the campus deadline is not a basis for appeal.

Appeal Procedure
The student must file the appeal within 30 days of the nonresident notice issue date. Late appeals will be denied for further review unless the campus Residence Deputy requests waiver of the 30 day requirement on the Student's behalf.

- Completed, signed, and dated Application to Appeal a Nonresident Classification, and
- Campus Nonresident Classification notice, and
- Supporting documentation as described in Requirements to Appeal above.

Submit the Appeal by email (preferred) or fax to:
Email: **residency.appeal@ucop.edu**
Fax: (510) 987-9757, Attn.: Residency Analyst

Mail: Residency Analyst, UC Office of the General Counsel
1111 Franklin St.
Oakland, CA 94607-5200

Privacy Notice
All information requested on the Statement of Legal Residence form is required by the authority of Standing Order 110.2 (a)-(d) of the Regents of the University of California for determining whether you are a legal resident for tuition purposes. The residence affairs officer in the Office of the Registrar maintains the requested information. You have the right to inspect university records containing the residence information requested on the form.

For information on other policies applicable to students, visit **deanofstudents.ucr.edu**.

POLICIES AND REGULATIONS

Academic Policies

Catalog Rights Policy for Undergraduate Degrees

Students who enter UCR as freshmen normally follow the catalog in effect in their first year of studies. Transfer students who have completed appropriate transfer programs have prior catalog rights. Check with the college dean's office for more information.

Academic Senate Regulation R6.12 states as follows: To be awarded the bachelor's degree, a student must either (a) meet graduation requirements in the UCR catalog in effect in the year of their graduation from the Riverside campus; or (b) fulfill graduation requirements in one UCR catalog applicable during any of the previous four years in which the student successfully completed at least one quarter or one semester of full-time college-level work, regardless of where matriculated. Upon applying for candidacy, the student must specify the applicable catalog.

At UCR, courses are assigned a unit value determined by the number of hours of work per week required of the student. Specifically, Academic Senate regulations require three hours of work per week for each unit of credit. For example, in a 4-unit course scheduled to meet four hours per week, a student is expected to spend eight hours of preparation outside of class.

Grades in courses are assigned as follows:

Passing "A" (distinction), "B" (high pass), "C" (pass), "D" (marginal pass). Grade point values per unit are as follows: "A"=4, "B"=3, "C"=2, "D"=1. The grades "A," "B," "C," and "D" may be modified by plus (+) or minus (-) suffixes. Minus grades carry three-tenths grade point less per unit, and plus grades (excluding "A+") carry three-tenths grade point more per unit than unsuffixed grades.

Not passing "F" (failure). No grade point value.

Grade Delay "GD." Assigned temporarily when grade posting is delayed for administrative reasons. Students who see "GD" on their grade report or transcript should contact their instructor for clarification.

Incomplete "I." Units are not charged and grade points are not assigned.

Withdrawal "W." Course dropped after the end of the add/drop period. Units are not earned and grade points are not assigned.

The grade point average (GPA) is determined by multiplying each grade point value by the number of units assigned to the course, adding up these grade point units, and dividing the total grade point units by the total number of units for which letter grades are received.

Satisfactory/No Credit Grades

A student in good standing may undertake courses on a Satisfactory/No Credit (S/NC) basis subject to the following limitations: the grade "S" is awarded for work satisfactory for unit credit in meeting degree requirements. For undergraduates, the requirement is a "C" average (2.00); for graduate students, it is a "B" average (3.00). Units are assigned for courses graded "S," but "S" has no grade point equivalent and does not enter the GPA. Neither units nor grade points are assigned for an "NC" grade; the grade is recorded on the transcript but does not enter the GPA.

Some graduate and undergraduate courses may, in accordance with regulations, be designated for grading on an S/NC basis only. Students should consult the School of Education before electing courses on an S/NC basis to be used for a teaching credential.

Students enrolled in an undergraduate degree program may receive credit for courses undertaken and graded "S" on the UCR campus to a limit of one-third of the total units undertaken and passed on the Riverside campus at the time the degree is awarded. Units completed at another UC campus by a UCR undergraduate student (intercampus visitor) will be considered UCR coursework for the purposes of this regulation.

Courses required in or prerequisite to the undergraduate student's major subject may be taken on an S/NC basis only on approval of the chair of the student's department (or other primary instructional unit) in each individual case. A student on "limited" status may take courses on an S/NC basis at the discretion of the dean of the school or college in which the student is enrolled. Courses in the X or XR300, X400, or 300 series (UCR Extension coursework) are not subject to the one-third limitation on courses graded "S." For additional limitations on 300 and 400 series courses, see individual college sections in the Undergraduate Studies section of this catalog.

An undergraduate student may elect "S/NC" for a course or revert to a letter grade by filing an Enrollment Adjustment Form through **myforms.ucr.edu**. The deadline is the end of the eighth week of instruction and is listed each quarter at **registrar.ucr.edu** **(click on Academic Calendar)**. Graduate students should refer to the Graduate Studies section of the catalog for S/NC policy and procedures.

Incomplete Grades

The grade "I" (incomplete) is a provisional grade which denotes that a student's work was of passing quality but incomplete for good cause. Incomplete units are attempted, but not earned. The grade of "I" may be replaced if the work is completed as specified by the instructor prior to the end of the following quarter. When a course graded "I" has not been successfully completed after one additional quarter or by the time the student is ready to graduate (whichever is less), it will be replaced by a grade of "F" or by "NC" (if the course were taken on an S/NC basis). The appropriate dean may extend the time for successful completion when he or she considers that circumstances warrant it, provided the request is received before the grade "I" is changed to "F" or "NC."

In Progress Grades

For certain courses extending over more than one term, where, by consent of the Academic Senate, evaluation of the student's performance may be deferred until the end of the final term, provisional grades of "IP" (in progress) are assigned in the intervening terms.

Neither units nor grade points are assigned for "IP" grades. The provisional grades are replaced by the final grade if the student completes the full sequence. In the event that the full sequence is not completed, the grade "IP" is replaced by the grade "I," and further changes in the student's record are subject to regulations governing the grade "I."

Workload Credit

Workload credit is granted for UCR preparatory courses required for regular university work. Workload credit does not carry units for graduation, but does count as part of the academic course load for determining enrollment status. Workload credit will not be calculated in the GPA. Grades assigned for workload credit have a leading "W" before the official grade.

Repetition of Courses

Repetition of courses not authorized to be taken more than once for credit is subject to the following conditions: generally, a student may repeat only courses in which a grade of "D," "F," or "NC" was received. Courses that would place the student above the 16 unit maximum will not be included and will not be split.

In some circumstances, students may repeat a "C-" to satisfy an academic requirement. For example, in courses taken to meet the Entry Level Writing Requirement, such as ENGL 004 and ENGL 005, students must earn a grade of "C" or higher to satisfy the requirement, so students who receive a grade of "C-" may repeat the course.

Degree credit for a course will be given only once, but the grade assigned at each enrollment shall be permanently recorded. In computing GPA of an undergraduate who repeats courses in which the student received a "D" or an "F," only the most recently earned grades and grade points shall be used for the first 16 units repeated. In the case of further repetitions, the GPA shall be based on all grades assigned and the total units attempted. Courses in which a grade of "D" or "F" has been earned may not be repeated on an S/NC basis. Repetition of a course more than once requires approval by the appropriate dean in all instances.

The Department of Veterans Affairs will not consider toward full time those units which are a repeat of courses in which a grade of "D-" has been received, unless a higher grade in the course is specifically required for graduation. Contact the Financial Aid Office, (951) 827-3878, for additional details.

Change of Grade

All grades except "I" and "IP" become final when they are assigned. No term grade may be revised by reexamination. No change of grade may be made on the basis of reassessment of the quality of a student's work. However, at the discretion of the instructor in charge of a course, reexamination and reassessment of work may be allowable under the terms of the Sanctioning Guidelines of the UCR Academic Integrity Policy. See Academic Integrity later in this section. An instructor may submit an approved grade change to the Office of the Registrar at any time until the degree is conferred, when clerical or procedural errors have been made while assigning, transmitting, or recording of the original grade.

Procedures for the Appeal of Grades

The Regulations of the Riverside Division of the Academic Senate state that if a student believes that nonacademic criteria have been used in determining a grade, the student shall attempt to resolve the grievance with the instructor of the course through written appeal to the instructor via the chair of the department. If the grievance is not resolved to the student's satisfaction at the departmental level, the student may file a complaint with the dean of the college or school having jurisdiction over the course or with the dean of the Graduate Division if the student is in graduate status. The complaint should be filed immediately after the alleged use of nonacademic criteria but no later than six weeks after the beginning of the subsequent quarter. Nonacademic criteria are criteria not directly reflective of class performance, such as discrimination on political grounds or for reasons of race, religion, sex, or ethnic origin or for other arbitrary or personal reasons.

Expected Progress for Undergraduate Students

Expected Progress

A full-time undergraduate student is considered to be making Expected Progress toward a baccalaureate degree if he or she:

1. passes at least 45 units each academic year,
2. declares a major by the time the student earns 90 units, and
3. follows a program of study consistent with the requirements of the student's declared major or undeclared student's College or School.

Continued Registration

A full-time undergraduate student is considered ineligible for Continued Registration if he or she:

1. does not pass at least 37 units in each academic year, or
2. does not complete the Expected Progress requirements as stated above.

Failure to Meet Criteria for Continued Registration

Registration of a full-time undergraduate student who is ineligible for Continued Registration under any of the criteria described above shall be at the discretion of the faculty in the student's College or School or Associate Dean for Student Academic Affairs in each College or School.

Units Passed

For purposes of determining eligibility for Continued Registration, in addition to units earned by passing regularly enrolled courses, the following defines what shall be counted as units passed.

1. Workload only, non-credit courses with passing grades shall be counted as units passed.
2. If a student receives a grade of "D" in a course and then repeats and passes the course, the units from each enrollment shall be counted as units passed during the quarter the course was taken, provided the student has not accumulated more than a total of 16 repeated units.
3. Units earned during a summer session, either at UCR or another accredited school and transferred to UCR, shall be counted as units passed during the academic year immediately preceding the summer session.
4. Units passed by examination shall be counted as units passed during the quarter in which the examination was taken.
5. Units graded IP (In Progress) shall be counted as units passed.
6. Units graded I (Incomplete) are not counted as units passed. When the grade of I is replaced by a passing grade, the units shall be counted toward Expected Progress for the quarter in which the I grade was awarded.

Units of Courses Taken at Other Institutions

A student is prohibited from obtaining transfer units for courses taken at a non-University of California campus in a quarter during which the student is enrolled as a full-time student at UCR. Summer session course work is exempt from this restriction.

1. To request an exception, a petition must be submitted to and approved by the appropriate College or School committee or administrative officer prior to the quarter of concurrent enrollment.
2. In those instances where approval has been granted, units earned from courses taken at a non-University of California campus shall be counted toward the Expected Progress in the quarter(s) in which the concurrent enrollment occurred.

Posthumous Awards

The University of California, Riverside seeks to extend sympathy and compassion to the families of students who pass away near the completion of their degrees and to recognize the academic achievement of students who would have fulfilled the requirements of the degree. These actions must also be balanced with attention to academic and institutional integrity. For more information on identifying and considering candidates for the award of posthumous undergraduate degree, please contact the Office of Student Affairs in the appropriate college. For posthumous graduate degrees, contact the Graduate Division.

Final Examinations

The instructor in charge of an undergraduate course shall be responsible for assigning the final grade in the course. The final grade shall reflect the student's achievement in the course and shall be based upon adequate evaluation of that achievement. The instructor's methods of evaluation must be clearly announced during the progress of the course. Evaluation methods must be of reasonable duration and difficulty and in accord with applicable departmental policies. The methods may include a final written examination, a term paper, a final oral examination, a take-home examination, or other evaluation device. If a final written examination is given, it shall not exceed three hours in duration and shall be given only at the time and place announced at registrar.ucr.edu. No student shall be excused from assigned final examinations.

Backdating Units

UCR graduate students may use, with the approval of their Graduate Advisor, any relevant 200-level course(s) taken during a UCR bachelor's program toward a graduate degree at UCR, excluding any 200-level course(s) approved to count for bachelor's degree, unit, or GPA requirements. Alternatively, the Graduate Advisor may approve waiving degree requirements based on 200-level courses taken as a UCR undergraduate and require the student to complete minimum unit requirements while enrolled in a graduate program.

Credit by Examination

Credit by examination may be earned in accordance with regulations established by each college. The student should consult the Undergraduate Studies section of this catalog for specific regulations.

A UCR student in residence may take examinations for degree credit in courses offered on the campus without formally enrolling in them. The results of the examinations are entered upon the student's record.

Undergraduate Credit for Graduate Courses

Students interested in obtaining undergraduate credit for graduate courses should contact the office of the dean of their college for further information.

Undergraduate classification is determined by the number of quarter units earned. Postbaccalaureate and graduate classifications are based on the student's academic objective and whether or not the student is advanced to candidacy for a doctorate.

Class Standing

Classification	Completed Units
Undergraduate	
First-year	0–44.9
Sophomore	45–89.9
Junior	90–134.9
Senior	135 or more
Credential Only	
Medical Program	
Graduate	
Master's	
Doctoral 1 (not advanced to candidacy)	
Doctoral 2 (advanced to candidacy)	
Visitor/Non-degree seeking	
Post-Baccalaureate	

Scholarship Regulations

Academic Standing

To remain in good academic standing, a student must maintain a GPA of at least 2.00 and make progress toward the degree at a satisfactory rate.

Academic Notice

Students are placed on academic notice if, at the end of any term, their GPA for the term is less than 2.00 or their cumulative GPA, computed on the total of all courses undertaken in the university, is less than 2.00 ("C" average).

Academic Disqualification

Students are subject to disqualification from further registration in the university a) if, at the end of any term, their GPA for that term is less than 1.50 or b) if, after two terms on academic notice, their cumulative GPA, computed on the total of all courses undertaken in the university, is less than 2.00 ("C" average).

Students who are subject to the provisions of this regulation are also subject to such supervision as the faculty of their college may determine. The faculty may disqualify a student under its supervision from further registration in the university or, by suspending the provisions of this regulation, may permit a student subject to disqualification to remain in the university.

Undergraduate students who are disqualified are excluded from the university, and their connection with the university is presumed to be ended by such exclusion. Under certain circumstances, disqualified students may be readmitted if approved after submitting a petition to their college and after meeting with their dean. Ordinarily, students are not readmitted until after the lapse of a year and unless their deficiencies are reparable within a reasonable period of time. During the period of disqualification, a student must give evidence of conduct which indicates that improved academic performance can be expected upon readmission. If readmitted, students must remove their deficiencies through above-average work undertaken in the university. It is usually required that all deficiencies be removed during the first year after readmission.

To transfer from one campus of the university to another, or from one college to another on the same campus, students who have been disqualified or who are on academic notice must obtain the approval of the appropriate dean to whose jurisdiction transfer is sought. Upon completion of the transfer, the students are subject to such supervision as the faculty of their college may determine.

Title 38 Beneficiaries

To maintain eligibility for Department of Veteran Affairs programs, Title 38 beneficiaries must maintain a GPA of at least 2.00 and make progress toward the degree at a satisfactory rate.

All received grades and statuses of no credit "NC", withdrawal, unauthorized withdrawal, academic notice, and disqualification will be reported to the VA. If a student does not have earned credit towards their Academic Requirements, the student must notify the VA Certifying Official in writing within 10 days by submitting their last date of attendance. This date will be verified in accordance with VA regulations and may result in the retroactive loss of benefits.

Incomplete grades must be resolved within the next quarter of enrollment. If grades remain incomplete after the next quarter of enrollment, this will be reported as a "NC" to the VA. Student will be responsible to pay any retroactive losses as the result of this reporting.

Final quarter grades that result in either a term or a cumulative GPA of less than 2.00 will cause an undergraduate student to be placed on academic notice. If a student is on academic notice for 2 consecutive quarters, they are not eligible for certification of VA education benefits.

Certification for VA benefits will resume when the student is no longer on VA Academic Notice. Questions should be directed to the Financial Aid Office at finaid@ucr.edu, or you can find additional resources at https://studentdocs.ucr.edu/financial-aid/uc-riverside_financial-aid_veterans-brochure.pdf.

UCR will not prevent enrollment, assess late registration fees, require alternate or additional funding, or deny access to campus resources available for students using VA Education Chapter 33 (Post-9/11 GI Bill®) or Chapter 31 (Vocational Rehabilitation) benefits while payment is pending from the VA (up to 90 days). To qualify, provide a Certificate of Eligibility or an eBenefits GI Bill Statement of Benefits and all required VA forms needed to certify enrollment by the first day of class. For more information please see the Veterans Benefits and Transition Act of 2018, section 103.

Programs for Outstanding Students

Departments of the colleges offer and administer various courses and honors programs for specially prepared, outstanding students. In some departments, equivalent special studies and seminar programs have been designed for students with special aptitudes. Interested students should consult their faculty advisors early for details of the program in their major department.

Honors

Dean's Honor List

Undergraduates who successfully complete a quarter with a minimum of 12 units with letter grades (B or higher), and have a term GPA of 3.50 or higher is placed on the Dean's Honor List. Student may not have any grades of "W", "NC", or "I" for that quarter to qualify.

Chancellor's Honor List

Students who are placed on the dean's honor list for all three quarters in a single academic year (fall, winter, and spring) are placed on the Chancellor's Honor List for that academic year.

Graduation with Honors

The Academic Senate has established the following standards for award of honors at graduation: No more than the top 2 percent (by GPA) in the June graduating class shall receive highest honors. No more than the next 4 percent of graduating students shall receive high honors, and no more than the next 10 percent shall receive honors. To be eligible for honors at graduation, a student must have completed 60 or more quarter units of graded courses at the UC. The GPAs used to determine class rank shall be based on courses taken at the UC.

Students may obtain a statement of the specific requirements for graduation with honors from the office of the dean of their college.

University Honors Program

For a description of the University Honors Program, see Educational Opportunities in the front of this catalog. For a listing of requirements and courses, refer to University Honors Program in the Programs and Courses section of this catalog.

Academic Integrity

Academic Integrity for Students at the University of California, Riverside.

Policy

University Of California Policies Applying to Campus Activities, Organizations, and Students, section 100.00 Policy on Student Conduct and Discipline states that "Chancellors may impose discipline for the commission or attempted commission (including aiding or abetting in the commission or attempted commission) of the following types of violations by students:

102.1 All forms of academic misconduct including but not limited to cheating, fabrication, plagiarism, or facilitating academic dishonesty.

102.2 Other forms of dishonesty including but not limited to fabricating information, furnishing false information, or reporting a false emergency to the University."

Principles of Academic Integrity

At the University of California, Riverside (UCR) honesty and integrity are fundamental values that guide and inform us as individuals and as a community. The culture of academia requires that each student take responsibility for learning and for products that reflect their intellectual potential, curiosity, and capability. Students must represent themselves truthfully, claim only work that is their own, acknowledge their use of others' words, research results, and ideas, using the methods accepted by the appropriate academic disciplines and engage honestly in all academic assignments. Anything less than total commitment to honesty circumvents the contract for intellectual enrichment that students have with the University to become an educated person, undermines the efforts of the entire academic community, and diminishes the value of an education for everyone, especially for the person who cheats. Both students and faculty are responsible for ensuring the academic integrity of the University.

These guidelines establish definitions for academic misconduct and procedures for the adjudication of academic integrity cases by the Office of Student Conduct and Academic Integrity Programs (SCAIP) for undergraduate students and Graduate Division for graduate student cases.

Misunderstanding of appropriate academic conduct will not be accepted as an excuse for academic misconduct. If a student is in doubt about appropriate academic conduct in a particular situation, he or she should consult with the instructor in the course to avoid the serious charge of academic misconduct.

Types of Academic Misconduct

The following provides definitions of academic misconduct to assist students in developing an understanding of the University's expectations, recognizing that no set of written guidelines can anticipate all types and degrees of violations of academic integrity. To the extent that these definitions are not exhaustive, duly appointed representatives of the University will judge each case according to its merits. If a referral requires further expertise, additional appropriate representatives may be designated to review. Types of academic misconduct include, but are not limited to:

Cheating
Fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

Fabrication
Making up data or results and recording or reporting them, including laboratory or field research results. In the context of student academic integrity, this also includes falsifying academic or university documents and providing false information or testimony in connection with any investigation or hearing under this policy.

Falsification
Manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record

Plagiarism
The appropriation of another person's ideas, processes, results, or words without giving appropriate credit. This includes the copying of language, structure, or ideas of another and attributing (explicitly or implicitly) the work to one's own efforts. Plagiarism means using another's work without giving credit.

Facilitating academic dishonesty
Assisting another in violating the policy of Academic Integrity, such as taking an exam for another student or providing coursework for another student to turn in as their own effort.

Unauthorized collaboration
Working with others without the specific permission of the instructor on assignments that will be submitted for a grade. This applies to in-class or take-home tests, papers, labs, or homework assignments. Students may not collaborate without faculty authorization.

Interference or sabotage
Damaging, removing, or otherwise harming another student's work or University materials and systems to affect the academic performance of others.

Research non-compliance is a failure to comply with research regulations such as those applying to human subjects, vertebrate animals, biosafety, stem cells, conflict of interest, responsible conduct of research training, and conflict of interest disclosures.

Retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.



Undergraduate Students

Requirements and Expectations

Research

To foster intellectual honesty with regard to undergraduate research, all academic units at UCR are encouraged to develop statements that fit the distinctive research climate and needs of their individual disciplines. These guidelines may cover responsibilities of research supervisors, assignment of credit for publications, training of research apprentices, requirements for record keeping of experimental procedures and data storage.

Policies relevant to research and agencies funding research are posted on the Research and Economic Development Office website: research.ucr.edu

Courses

Faculty members, teaching assistants, and other instructional personnel are encouraged to include statements addressing academic integrity as part of the syllabus for every course and to educate students about expectations and standards in the context of the course in order that students may not, through ignorance, subject themselves to the charge of academic misconduct. Instructors are further encouraged to inform students of campus resources available for dealing with academic difficulty.

Undergraduate Procedures

Throughout the process of reviewing allegations of academic misconduct, this policy articulates deadlines for action based on calendar days. If the day of a deadline falls on a weekend, holiday, or day the University is otherwise closed, that deadline will be moved to the next day the University is open.

I. Faculty Actions

Research

In cases of alleged research non-compliance or research misconduct by faculty members, TA's, students, and other personnel, it should be reported to Vice Chancellor for Research who will be responsible for coordinating further actions.

Courses

If a faculty member, teaching assistant, or other instructional personnel suspects that an act of academic misconduct has occurred in a course, she or he must promptly communicate with the student regarding the alleged act of misconduct and the information upon which the allegation is based within 30 calendar days of discovery of the alleged act. Under special circumstances, the instructor may make a request for an extension of time through the Vice Provost for Administrative Resolution. If the discovery is made by a teaching assistant, reader, grader, or tutor, the TA should immediately communicate to the Faculty member in charge of the course, so that the Faculty member in charge can proceed with the investigation.

Whenever possible, the communication should take place through an in-person consultation and should be conducted in a manner that respects each student's privacy and maintains an environment that supports teaching and learning. When a meeting is not possible or practical, an instructor may communicate with the student in writing. Written communcation will be sent to the student's University e-mail address. When multiple student are involved, in order to preserve a students right to privacy, the faculty member is asked to communicate with each student separately.

The Faculty member or the student may request the assistance of the Ombudsperson at the conference to assist in a fair and focused discussion about what may have occurred.

The student must be given the opportunity to respond to the allegation of misconduct. When communication is made in writing, students will be given 14 calendar days to respond.

After conferring with the student and/or considering the student's written response, the faculty member may determine there has been no misconduct, in which case the instructor may dismiss the allegation and take no further action.

If the faculty member determines that it is more likely than not that the student committed an act of academic misconduct, regardless of the student's intent to engage in misconduct, the instructor may then pursue one of the following actions:

A. In cases where the student does not dispute the facts upon which the charges are based, the instructor may impose an appropriate academic sanction, taking into account the clarity of course expectations, the level of the student's experience or knowledge of principles of academic integrity, the nature of the assignment, and the degree of intentionality and pre-meditation of the misconduct. These admissions of guilt and the sanction the instructor imposes are final.

Actions taken must be documented through the Academic Misconduct Referral form, or a referral memo to SCAIP, the central location where all records of incidents of academic dishonesty are kept on file. It is essential that the form or referral memo include the student's name and student identification number, the name of the class in which the act took place, the date or time period in which the act occurred, a description of the academic misconduct, a summary of actions taken, all original documentation supporting the charge, and the academic sanctions assigned.

B. In cases where the student disputes the facts upon which the charges are based, the instructor will refer the case to SCAIP. The Academic Misconduct Referral form, available at conduct.ucr.edu, or memo must include the student's name and student identification number, the name of the class in which the act took place, the date or time period in which the act occurred, a description of the academic misconduct, a summary of actions taken by the instructor, all original documentation supporting the charge (except where prohibited by law), and the academic sanctions recommended. Faculty members are encouraged to forward a copy of the course syllabus and other written communication that addresses academic integrity standards and expectations for the course. Faculty are further encouraged to evaluate the assignment or examination on its merits and to make note of the grade to be assigned in the event that the student is not found responsible for violation of the University's policies or where insufficient evidence exists to hold the student responsible.

Faculty members who will not be available to participate fully in resolving allegations (e.g., Individuals holding part-time or temporary appointments, those on sabbatical or other leave, or those leaving University employment) must provide a copy of all documentation to the immediate supervising administrator: department chair, program director, center director, or dean of school, who will serve as a proxy for the Faculty member to conclude the case.

If grades are awarded while the case is in progress, the Faculty member is expected to assign a temporary grade placeholder of Grade Delay "GD" pending the outcome of the review process.

The Faculty member is encouraged to evaluate the disputed assignment or examination on its merits and to note the grade to be assigned in the event that the student is not found responsible for violation of the University of California Policy on Student Conduct and Discipline or where insufficient evidence exists to hold the student responsible.

C. Violations that the instructor believes to be particularly egregious shall be referred directly to the School or College Academic Integrity Committee in the instructor's School or College for review.

The student may not avoid the imposition of a sanction by withdrawing from a course. If the student is found not responsible for academic misconduct, the student will be permitted to request a withdrawal from the course with a grade of "W". Students should use an Undergraduate Enrollment Adjustment Form in this case.

II. Administrative Actions

Research

The Vice Chancellor of Research will review the details of alleged research misconduct in accordance with the relevant policy.

Courses

The following table provides information on the investigation and review process.

Action	Responsible Body: Undergraduate Students
Initiation of Cases • If a faculty member is suspicious of misconduct in a course, they are to communicate with the student to determine if it can be handled at this level, or will require an official Administrative Review. • Faculty member documents actions via Academic Misconduct Referral Form for Review Stage 1	**Faculty Member**
Review Stage 1 • Administrative Review	**Student Conduct and Academic Integrity Programs [SCAIP]**
Review Stage 2 • Hearings for cases that are complex, egregious, and/or repeated cases of misconduct • Appeals of decisions made at Review Stage 1	**Academic Integrity Committees of each college/school [AICs]** **Hearing panels constituted from the AICs**
Review Stage 3 • Annual assessments of cases addressed at Review Stages 1 & 2 • Appeals of primary decisions made at Review Stage 2	**Campus Academic Integrity Executive Committee**

A. In cases where the student does not dispute the facts upon which the charges are based, SCAIP, upon receipt of the Academic Misconduct Referral form, will follow up with the student in writing to formally advise the student of the academic sanctions assigned by the instructor as well as appropriate disciplinary sanctions assigned by the University.

The decision shall be forwarded in writing to the student within 20 calendar days of the review; and communicated to the instructor, school or college and/or division in accordance with legitimate educational interest criteria as articulated by the Family Education Rights and Privacy Act.

Students with a record of previous academic misconduct will be referred to the Academic Integrity Committee in their School or College for a formal hearing (Review Stage 2), with a recommendation that suspension or dismissal be considered

B. In cases where the student disputes the facts upon which the charges are based, upon receipt of the Academic Misconduct Referral Form, SCAIP will notify the student of their alleged violation of the University of California Policy on Student Conduct and Discipline, the factual basis for the charges, and the plan to conduct a Review Stage 1 Administrative Review of the case. The student will be advised that the Administrative Review is intended as a thorough exposition of all related facts and written materials associated with the alleged misconduct, and that it is not intended as an adversarial criminal or civil legal proceeding. It is not modeled on these adversarial systems; nor does it serve the same functions; rather, it is an academic process unique to the community of scholars that comprise a University. The student will also be informed of their right to be assisted by an advisor of their choice. Such written notification will occur within 20 calendar days of the receipt of the referral by SCAIP and will be sent to the student's University e-mail address.

1. Review Stage 1, Administrative Review, process:

The Administrative Review conducted by SCAIP involves meetings with the student, the Faculty member, and others who may have relevant information. The student will have the opportunity to discuss any extenuating circumstances, causes, and motivations that may have contributed to the alleged misconduct. If SCAIP deems it necessary, the Administrative Review will be scheduled such that both the faculty member and the student can attend. The purpose of an Administrative Review is to explore and investigate the incident giving rise to the appearance of academic dishonesty, and to reach an informed conclusion as to whether or not academic dishonesty occurred. In keeping with the ultimate premise and justification of academic life, the duty of all persons at a Review is to assist in a thorough and honest exposition of all related facts. A Review is not in the character of a criminal or civil legal proceeding. It is not modeled on these adversarial systems; nor does it serve the same functions; rather, it is an academic process unique to the community of scholars that comprise a University.

The review will:

- explain fully the alleged violation of the Standards of Conduct
- review written materials associated with the alleged misconduct
- give the student and the instructor the opportunity to present their accounts of the incident and present any witnesses or other individuals who may have relevant information about the incident
- address how the student's alleged conduct was judged, why the behavior is unacceptable, the impact of conduct on others in the community, causes and motives of the conduct, and alternatives for balancing personal circumstances with needs and expectations of the community

2. Outcome of the Administrative Review:

If SCAIP determines it is more likely than not that the student is responsible for academic misconduct, the academic sanctions recommended by the faculty member as well as appropriate disciplinary sanctions will be assigned taking into account the clarity of course expectations, the level of the student's experience or knowledge of principles of academic integrity, the nature of the assignment, and the degree of intentionality and premeditation of the misconduct.

The decision shall be forwarded in writing to the student within 20 calendar days of the review and communicated to the instructor, school or college and/or division in accordance with legitimate educational interest criteria as articulated by the Family Education Rights and Privacy Act. In cases where the instructor has held a grade in abeyance pending the outcome of an Administrative Review, the instructor shall submit a final grade with the Registrar that is consistent with the decision of SCAIP as to the question of misconduct.

3. Appeals of Decisions by Faculty Members and/or from Review Stage 1:

Academic Integrity Committees, described in Section C function as the appellate bodies for decisions made at Review Stage 1. Section E below more fully explains appeal procedures.

C. Cases involving a student with a record of previous academic misconduct or cases that are sufficiently complex to require additional consultation shall be referred directly by SCAIP for a Stage 2 review by the Academic Integrity Committee in the relevant college/school for a formal hearing.

III. Academic Integrity Committees

1. Review Stage 2, College/School Academic Integrity Committees for Cases Involving Undergraduate Students

An Academic Integrity Committee will be established in each School or College[1] to:

- hear cases referred by SCAIP that are sufficiently complex to require additional review
- hear serious and repeated violations of academic misconduct upon referral from an instructor or SCAIP
- consider appeals of decisions and/or sanctions imposed by SCAIP

The Academic Senate's Committee on Committees will appoint four faculty members from each of BCOE, CNAS, and SoB, and six from CHASS to the undergraduate Academic Integrity Committees for each college/school to serve one-year terms, effective September 1-August 31. Each committee should include faculty who are available to participate in hearings during the summer months.

In addition, SCAIP will solicit and review applications from interested undergraduate and graduate students and make recommendations to the Associated Students of UCR and Graduate Student Association regarding students to be appointed to serve on each college/school committee for one-year terms, effective September 1-August 31. The final endorsement of student members will rest with the Committee on Committees. Students are not eligible to serve if they have been suspended or are on academic notice or disciplinary probation, have been evicted from University Housing for reasons related to conduct, or have a case pending before SCAIP. (Am 20 February 07)

In all cases an effort will be made to appoint members who represent the disciplinary diversity within each college/school, whenever possible. Staff support to the committees will be provided by the office of the Vice Provost for Administrative Resolution, the office of the AVC/Dean of Students, and SCAIP.

2. Hearing Panels

SCAIP will schedule a hearing panel of three to five members, from the relevant AIC for each case. A quorum of the committee consists of three persons, with at least one faculty member and one student for School or College Committees. In the absence of a quorum, the hearing will be rescheduled. Staff support to the Committee will be provided by the Vice Provost for Administrative Resolution or their designee.

The purpose of an Academic Integrity Committee Hearing is to explore and investigate the incident giving rise to the appearance of academic dishonesty, and to reach an informed conclusion as to whether or not academic dishonesty occurred. In keeping with the ultimate premise and justification of academic life, the duty of all persons at a hearing is to assist in a thorough and honest exposition of all related facts. A hearing is not in the character of a criminal or civil legal proceeding. It is not modeled on these adversarial systems; nor does it serve the same functions; rather, it is an academic process unique to the community of scholars that comprise a University.

The Vice Provost for Administrative Resolution or their designee will serve as a non-voting administrative chair to facilitate the hearing. The administrative chair shall rule on all questions of procedure and evidence, including but not limited to: the order of presentation of evidence, admissibility of evidence, applicability of regulations to a particular case, and relevance of testimony.

3. Hearing Procedures

Preparation: Prior to the hearing, panel members will receive and review a copy of the notification of charges and documentary evidence provided by the instructor, the University, and the student.

Introductory comments: At the beginning of the hearing, the administrative chair will ask all present at the hearing to introduce themselves for the record. The administrative chair will ask any panel members to disqualify themselves from participation if they believe for any reason that they cannot render a just and fair decision and will permit the student to request that a member be disqualified if the student believes for an appropriate reason that a panel member cannot render a just and fair decision. If a student or faculty member of the hearing panel is disqualified, another member will be appointed to fill the same role, if needed for a quorum. The chair will read aloud the charges of academic misconduct and the student will be asked to respond to the charges by (a) accepting responsibility, (b) accepting responsibility and noting that there are mitigating circumstances, or (c) denying responsibility for the alleged violation of the University of California Policy on Student Conduct and Discipline.

Presentation of accounts: The faculty member and the student will be given the opportunity to present their accounts of the incident and present any witnesses or other individuals who may have relevant information about the alleged academic misconduct. Hearing panel members will be given an opportunity to ask questions of the faculty member, the student, and witnesses. Each party will then be asked if there is additional information needed, or if any discrepancies or questions need to be presented or addressed.

Deliberation: The hearing panel will deliberate in private to decide, by a majority vote, if a preponderance of the evidence indicates that the student is responsible or not responsible for alleged violation of University of California Policy on Student Conduct and Discipline.

If the student is found to be responsible for violations of the Policy, the Committee shall be informed of the student's prior record to determine whether the student has been found responsible for previous academic misconduct. Based on this information, the Committee will determine the sanction(s) to be assigned.

Notification of decision: Once the hearing panel has reached a decision, the parties involved will reassemble, and the results of the deliberation will be presented. Within 20 calendar days, the Vice Provost for Administrative Resolution or their designee will send written notification to the student, the faculty member, and the dean or their designated associate dean for student academic affairs of the college/school detailing the decision and the sanctions imposed by the hearing panel. The notification will also outline the appeal process.

Records: An audio recording of the hearing, but not the deliberations, shall be made and retained in SCAIP as part of the record for as long as the disciplinary record is retained, or for seven years from the date of decision, whichever is shorter (see Section F below). The student may obtain a copy of the recording upon paying the expense of making such copy. Either the student with conduct under investigation or the faculty member may arrange for a stenographer to make a full transcript of the proceedings at their own expense. If one party has the proceedings transcribed, arrangements shall be made before the hearing as to how to apportion the cost if both parties want copies. Other than for the purpose of the official record as provided above, mechanical or electronic devices for recording or broadcasting shall be excluded from the hearing.

4. Students may appeal the decision of Stage 2 review by the Academic Integrity Committees in writing to the Campus Academic Integrity Executive Committee

College Academic Integrity Executive Committee

The Vice Provost for Administrative Resolution or their designee shall select one faculty member and one student from each Academic Integrity Committee to serve as the Campus Academic Integrity Executive Committee for undergraduates. The Campus Academic Integrity Executive Committee also serves as the appellate body for primary decisions made at Review Stage 2 for undergraduate students. The Executive Committee will also review, on an annual basis, cases addressed by SCAIP and Academic Integrity Committee actions to provide oversight and direction and to ensure that policies and procedures are appropriate and properly applied.

IV. Appeals

1. Channels for Appeals

Stage 1 Review decisions made by SCAIP may be appealed through the School or College Academic Integrity Committee in the faculty member's School or College. Appellate decisions of a School or College Academic Integrity Committee are final.

Stage 2 Review decisions made by a School or College Academic Integrity Committee may be appealed to the Campus Academic Integrity Executive Committee. Appellate decisions of the Campus Academic Integrity Executive Committee are final.

2. Criteria for Appeals

- New evidence not reasonably available at the time of the original hearing, the absence of which can be shown to have had a detrimental impact on the outcome of the hearing
- Procedural error that can be shown to have had a detrimental impact on the outcome of the hearing
- Errors in the interpretation of University policy so substantial as to deny one of the parties a fair hearing
- Grossly inappropriate sanction having no reasonable relationship to the charges

3. Appeal Procedures

- The Faculty member or the student may appeal a decision in writing to the appropriate body for appeal, as described above. The appeal must be made within 14 calendar days after the written decision is made available.
- Appeals must be authored and signed by the submitting party. Appeals produced by advisors or other non-parties will not be considered.
- The filing of a timely appeal suspends the imposition of sanctions until the appeal is decided. Grades or degrees will be withheld pending conclusion of the appeal.
- When an appeal has been filed, the relevant parties may be requested to respond in writing to the matters in question before a decision about the appeal is made. The non-appealing party, whether student or Faculty member, will be notified of the appeal as soon it has been received by the appropriate appellate body and will be given an opportunity to submit a written statement for consideration during the appeal process.
- The appellate body will determine whether the grounds for appeal have been satisfied and whether further process is necessary to resolve the appeal. Findings of fact will be accepted as determined by the original adjudicating body, unless the appellate body determines that the original adjudicating body acted in an arbitrary, capricious, or unfair manner.
- The appellate body will make a decision based on the written submissions within 20 calendar days, or indicate in writing what further process is necessary for final resolution.
- The appellate body may approve, reject, or modify the decision and sanction in question. The action taken shall be communicated in writing to the student, the faculty member, SCAIP, and/or the original adjudicating body within 20 calendar days after receipt of the appeal and related documents. The decision of the appellate body is final.

V. Maintenance Of Records

SCAIP shall serve as the central location where all written, audio, and electronic records of incidents of academic misconduct are kept on file. The records will be readily available for review by the Deans and Associate Deans of each College or School, the Dean of the Graduate Division, the Executive Vice Chancellor and Provost and the Vice Provost for Administrative Resolution, in accordance with legitimate educational interest criteria as articulated by the Family Educational Rights and Privacy Act.

The file of a student found in violation of campus regulations (including the transcripts or recordings of the hearing) will be maintained by the SCAIP for a period of at least seven years from the date of the letter providing notice of final disciplinary action, unless otherwise determined by the Vice Provost for Administrative Resolution. When a student is suspended as a result of a violation of the University of California Policy on Student Conduct and Discipline, the fact that suspension was imposed must be posted on the academic transcript for the duration of the suspension. When a student is dismissed as a result of a violation of this policy, the fact that dismissal was imposed must be posted on the academic transcript permanently.

VI. Scheduling for Hearings and Appeals

In general, Academic Integrity Committees will conduct hearing panels September through June, the main academic year. In special circumstances, including hearings involving graduating seniors and those involving course sequences and prerequisites, SCAIP and the Academic Integrity Committees will work to expedite the process and endeavor to hold summer hearings on a limited basis.

Regulations Specifically for Graduate Students

1. Requirements and Expectations in Research

To foster intellectual honesty with regard to graduate student research, all academic units at UCR are encouraged to develop statements that fit the distinctive research climate and needs of their individual disciplines. These guidelines may cover responsibilities of research supervisors, assignment of authorship or credit for publications, training of research apprentices, requirements for record keeping of experimental procedures and data storage.

It is the responsibility of each individual engaged in research at UCR to be informed of University policies relating to research and of the policies and procedures of the agencies funding research. Relevant policies are posted on the Research and Economic Development Office (RED) website: research.ucr.edu

2. Allegations of Misconduct in Research

All allegations of research misconduct by graduate students should be immediately reported to the Vice Chancellor of Research. The Vice Chancellor of Research serves as the UCR Research Integrity Officer and who, in furtherance of the University's obligations and responsibilities, has been delegated the administrative authority by the Chancellor with respect to the oversight, implementation, maintenance and updating of the Policy and Procedures for Responding to Allegations of Research Misconduct at the University Of California, Riverside. All complainants should consult the Policy and Procedures for Responding to Allegations of Research Misconduct at the University Of California, Riverside prior to bringing an allegation of research misconduct to the Vice Chancellor for Research and Economic Development.

The Vice Chancellor for Research or their designee will review the description of the research misconduct and all documentation supporting the charge. He/she will determine if misconduct may have occurred, and if so, may undertake an inquiry or formal investigation, following the guidelines outlined in the UCR Policy on Integrity in Research, posted on the UCR Office of Research website. In the event that the preliminary inquiry or formal investigation finds probable cause with respect to research misconduct to warrant disciplinary proceedings, charges of misconduct will be processed in accordance with procedures for adjudicating alleged academic misconduct in courses, as outlined below, beginning with Review Stage 1.

3. Requirements and Expectations in Courses

Instructional personnel responsible for courses (herein referred to as Faculty) are encouraged to include statements addressing academic integrity as part of the syllabus for every course and to educate students about expectations and standards of the course in order that students may not, through ignorance, subject themselves to the charge of academic misconduct. Faculty are further encouraged to inform students of campus resources available for dealing with academic difficulty.

4. Allegations of Misconduct in Courses

The table below shows the steps in the investigation and review process.

Action	Responsible Body: Undergraduate Students
Initiation of Cases • Communication with the student regarding suspected misconduct and documentation of actions via the Graduate Academic Misconduct Referral Form	**Faculty Member**
Review Stage 1 • Initial [Administrative] Review	**Associate Dean for Graduate Academic Affairs**
Review Stage 2 • Hearings for cases that are complex, egregious, and/or repeated cases of misconduct • Appeals of decisions made at Review Stage 1	**Graduate Academic Integrity Committee [GAIC]**
Review Stage 3 • Annual assessments of cases addressed at Review Stages 1 & 2 • Appeals of primary decisions made at Review Stage 2	**Graduate Council**

4.1. Initiation of Cases

If a Faculty member suspects that an act of academic misconduct has occurred in a course, he or she must promptly communicate with the student regarding the alleged misconduct and the information upon which the allegation is based; the notification process must occur within 30 calendar days from the discovery of the alleged act. The Faculty member may make a request for an extension of time through the Associate Dean for Graduate Academic Affairs. If the discovery is made by a student, teaching assistant, reader, grader or tutor he or she should immediately communicate to the Faculty member in charge of the course, so that the Faculty member in charge can proceed with the investigation.

Whenever possible, communication with the student should take place through an in-person consultation and should be conducted in a manner that respects the student's privacy and maintains an environment that supports teaching and learning. When multiple students are involved, Faculty are encouraged to communicate with each student separately. The Faculty member or the student may request the presence at the consultation meeting of the Ombudsperson.

When an in-person meeting is not possible, the Faculty member may communicate with the student in writing. Written communication should be sent to the student's University e-mail address.

The student must be given the opportunity to respond to the allegation of misconduct. When communication is made in writing, students will be given 10 calendar days to respond.

After conferring with the student and/or considering the student's written response, the Faculty member may determine that there has been no misconduct, in which case the Faculty member may dismiss the allegation and take no further action.

If the Faculty member determines that it is more likely than not that the student committed an act of academic misconduct, regardless of the student's intent to engage in misconduct, the case moves to Stage 1 in the review process.

Faculty members who will not be available to participate fully in resolving allegations (e.g., Individuals holding part-time or temporary appointments, those on sabbatical or other leave, or those leaving University employment) must provide a copy of all documentation to the immediate supervising administrator: department chair, program director, center director, or dean of school, who will serve as a proxy for the Faculty member to conclude the case.

If grades are awarded while the case is in progress, the Faculty member should assign a temporary grade placeholder of Grade Delay "GD" pending the outcome of the review process.

4.1.1. Student Admits Responsibility

If the student admits responsibility for the alleged misconduct, the Faculty member may immediately impose an appropriate academic sanction. The faculty member must document the case and the sanction on the Graduate Academic Misconduct Referral form and send the form to the Associate Dean for Graduate Academic Affairs. Faculty members are advised to consult with the Graduate Advisor for the student's program and with the Associate Dean for Graduate Academic Affairs prior to imposing the academic sanction.

4.1.2. Student Admits Responsibility

If the student does not admit responsibility but the Faculty member makes a determination of misconduct, the Faculty member will refer the case to the Associate Dean for Graduate Academic Affairs using the Graduate Academic Misconduct Referral Form. The referral form must include the student's name and student identification number, the name of the class in which the act took place, the date or time period in which the act occurred, a description of the academic misconduct, a summary of actions taken, all original documentation supporting the charge (including a copy of the course syllabus and other written communication that addresses academic integrity standards and expectations for the course) and the academic actions and disciplinary sanctions recommended by the Faculty member. Faculty members are advised to consult with the Graduate Advisor for the student's program and with the Associate Dean for Graduate Academic Affairs prior to recommending sanctions.

The Faculty member also will evaluate the disputed assignment or examination on its merits and note the grade to be assigned in the event that the student is not found responsible for violation of the University of California Policy on Student Conduct and Discipline or where insufficient evidence exists to hold the student responsible.

Upon receipt of the Academic Misconduct Referral Form, the Associate Dean for Graduate Academic Affairs will notify the student of the University of California Policy on Student Conduct and Discipline that was allegedly violated, the factual basis for the charges, and the plan to conduct an Initial [Administrative] Review of the case. The student will be advised that the Initial [Administrative] Review is intended as a thorough exposition of all related facts and written materials associated with the alleged misconduct, and that it is not intended as an adversarial criminal or civil legal proceeding. The student will also be informed of their right to be assisted by an advisor of his or her choice. Such written notification will occur within 20 calendar days of the receipt of the referral by the Associate Dean and will be sent to the student's University e-mail address.

A student may not avoid the imposition of a sanction by withdrawing from a course. A student officially notified of alleged academic misconduct may not withdraw from the course until the determination of responsibility is made and any sanctions are imposed. A sanction for a violation of academic integrity that affects the course grade will be applied. If the student is found not responsible for academic misconduct, the student will be permitted to withdraw from the course in accordance with campus regulations.

4.2. Review Stage 1: Initial [Administrative] Review

The Initial [Administrative] Review, conducted by the Associate Dean for Graduate Academic Affairs, involves meetings with the student, the Faculty member, and others who may have relevant information. The student will have the opportunity to discuss any extenuating circumstances, causes, and motivations that may have contributed to the alleged misconduct. If the Associate Dean deems it necessary, a joint meeting will be scheduled at a time when both the Faculty member and the student can attend. If the Faculty member is unavailable for a timely Initial [Administrative] Review, the immediate supervising administrator will be asked to serve in place of the Faculty member.

4.2.1. Outcome of the Initial [Administrative] Review

If the Associate Dean for Graduate Academic Affairs determines that it is more likely than not that the student is responsible for academic misconduct, the academic actions recommended by the Faculty member, as well as any disciplinary sanctions imposed by the University, will be assigned.

The determination shall be forwarded by the Associate Dean for Graduate Academic Affairs in writing to the student within 20 calendar days of the Initial [Administrative] Review; notice will be sent to the student's University e-mail address and communicated to the Faculty member and to the dean of the college/school in accordance with legitimate educational interest criteria as articulated by the Family Education Rights and Privacy Act. In cases where the Faculty member has held a grade in abeyance pending the outcome of an Initial [Administrative] Review, he or she shall submit a final grade to the Registrar that is consistent with the determination by the Associate Dean for Graduate Academic Affairs as to the question of misconduct. Either the student or faculty member can appeal the decision of the Associate Dean for Graduate Academic Affairs.

Cases involving a student with a record of previous academic misconduct or cases that are sufficiently complex to require additional consultation shall be referred directly by the Associate Dean for Graduate Academic Affairs for a Stage 2 review by the Graduate Academic Integrity Committee for a formal hearing.

4.3. Review Stage 2: Complex Cases and Appeals from Stage 1

Review Stage 2 is reserved for cases involving a student with a record of previous academic misconduct or cases that are sufficiently complex or egregious to require additional consultation by the Graduate Academic Integrity Committee [GAIC] for a formal hearing. Review Stage 2 also serves as the stage for appeals of decisions made at Review Stage 1. Appellate decisions at Review Stage 2 are final.

The Academic Senate's Committee on Committees will appoint faculty to the Graduate Academic Integrity Committee to serve one-year terms, effective September 1-August 31, and will appoint one faculty member from the GAIC to serve as chair. The GAIC will consist of at least one member from each school and at least two members from each college and should include faculty who are available to participate in hearing during the summer months.

In addition, the Graduate Division will solicit and review applications from interested graduate students and make recommendations to the Graduate Student Association of UCR regarding students to be appointed to serve on the GAIC for one-year terms, effective September 1-August 31. The final endorsement of student members will rest with the Committee on Committees. Students are not eligible to serve if they have been suspended or are on academic notice or disciplinary probation, have been evicted from University Housing for reasons related to conduct, or have a case pending before the Graduate Division, GAIC, or Graduate Council.

Faculty and student members should represent the disciplinary diversity within each college/school, whenever possible. Staff support to the committee will be provided by the Graduate Division.

4.3.1. Hearing Panels

For each Stage 2 case, the chair of the GAIC will schedule a hearing panel of three to five GAIC members. A quorum is required for a hearing to proceed and consists of three persons, including at least one faculty member and one student.

The Associate Dean for Graduate Academic Affairs or designee will serve as a non-voting member of the hearing panel. The chair of the hearing panel shall rule on all questions of procedure and evidence, including but not limited to: the order of presentation of evidence, admissibility of evidence, applicability of regulations to a particular case, and relevance of testimony.

4.3.2. Hearing Panels

1. **Preparation:** Prior to the hearing, panel members will receive and review a copy of the notification of charges and documentary evidence provided by the Faculty member, the University, and the student.
2. **Introductory comments:** At the beginning of the hearing, the chair will ask any panel members to disqualify themselves from participation if they believe that they cannot render a just and fair decision, and will permit the student to request that a member be disqualified if the student believes for an appropriate reason that a panel member cannot render a just and fair decision. If a student or Faculty member of the hearing panel is disqualified, another member will be appointed to fill the same role, if needed for a quorum. The chair will read aloud the charges of academic misconduct, and the student will be asked to respond to the charges by (a) accepting responsibility, (b) accepting responsibility and noting that there are mitigating circumstances, or (c) denying responsibility for the alleged violation of the University of California Policy on Student Conduct and Discipline.
3. **Presentation of accounts:** The Faculty member and the student will be given the opportunity to present their accounts of the incident and to present any witnesses or other individuals who may have relevant information about the alleged academic misconduct. Hearing panel members will be given an opportunity to ask questions of the Faculty member, the student, and witnesses. Each party will then be asked if there is additional information needed, or if any discrepancies or questions need to be presented or addressed.
4. **Deliberation:** The hearing panel will deliberate in private to decide, by a majority vote, if a preponderance of the evidence indicates that the student is responsible or not responsible for alleged violation of University of California Policy on Student Conduct and Discipline.
5. **Determination of sanctions:** If the student is found to be responsible for violations of policies, the hearing panel shall be informed of the student's prior record of academic misconduct. Based on this information and the recommendation of the faculty member, the committee will determine the disciplinary sanctions to be assigned, how and for how long the record of the sanctions will be maintained on the student's permanent record, and the conditions that must be met for the record to be removed, if any.
6. **Notification of decision:** Once the hearing panel has reached a decision, the parties will reassemble, and the results of the deliberation will be presented. Within 20 calendar days, the Associate Dean for Graduate Academic Affairs will send written notification to the student, the Faculty member, and the dean or their designated associate dean for student academic affairs of the college/school detailing the decision and the sanctions imposed by the hearing panel. The notification will also outline the appeal process.
7. **Records:** An audio recording of the hearing, but not the deliberations of the hearing panel, shall be made and retained by the Graduate Division as part of the record for as long as the disciplinary record is retained, or for seven years from the date of decision, whichever is shorter (see Section 6 below). The student may obtain a copy of the recording upon paying the expense of making such copy. Either party may arrange for a stenographer to make a full transcript of the proceedings at their own expense. If one party has the proceedings transcribed, arrangements shall be made before the hearing as to how to apportion the cost if both parties want copies. Other than for the purpose of the official record as provided above, mechanical or electronic devices for recording or broadcasting shall be excluded from the hearing.

4.4. Review Stage 3: Appeals from Stage 2 and Annual Assessment of Cases

Review Stage 3 is reserved for appeals of primary decisions made at Review Stage 2, and for annual assessment of cases adjudicated at Review Stages 1 and 2. For each Stage 3 case, the Chair of the Graduate Council or designee shall select a 3-5 member subcommittee of the Graduate Council to serve as an appeal panel. Each Stage 3 hearing will be conducted according to the Hearing Procedures described above in Section 4.3.2.

The Graduate Council additionally conducts annual assessments of cases adjudicated at Review Stages 1 and 2 for the purpose of providing oversight and ensuring that policies and procedures are appropriately and consistently applied.

5. Appeals

Decisions of the Associate Dean for Graduate Academic Affairs may be appealed to the GAIC. Appellate decisions by the GAIC are final. Primary decisions of the GAIC may be appealed to the Graduate Council. Appellate decisions by the Graduate Council are final. In any decision that includes a sanction of dismissal of a graduate student, the Dean of the Graduate Division will be the final arbiter.

5.1. Criteria for Appeals

Appeals must be based on one or more of the following:

- New evidence not reasonably available at the time of the original hearing, the absence of which can be shown to have had a detrimental impact on the outcome of the hearing
- Procedural error that can be shown to have had a detrimental impact on the outcome of the hearing

- Errors in the interpretation of University policy so substantial as to deny one of the parties a fair hearing
- Grossly inappropriate sanction having no reasonable relationship to the charges

5.2. Appeal Procedures

Appeals must be based on one or more of the following:

- New evidence not reasonably available at the time of the original hearing, the absence of which can be shown to have had a detrimental impact on the outcome of the hearing
- Procedural error that can be shown to have had a detrimental impact on the outcome of the hearing
- Errors in the interpretation of University policy so substantial as to deny one of the parties a fair hearing
- Grossly inappropriate sanction having no reasonable relationship to the charges

1. The Faculty member or the student may appeal a decision in writing to the appropriate body for appeal, as described above. The appeal must be made within 10 calendar days after the written decision is made available.
2. Appeals must be authored and signed by the submitting party. Appeals produced by advisors or other non-parties will not be considered.
3. The filing of a timely appeal suspends the imposition of sanctions until the appeal is decided. Grades or degrees will be withheld pending conclusion of the appeal.
4. When an appeal has been filed, the relevant parties may be requested to respond in writing to the matters in question before a decision about the appeal is made. The non-appealing party, whether student or Faculty member, will be notified of the appeal within 10 calendar days and will be given an opportunity to submit a written statement for consideration within 20 calendar days.
5. The appellate body will determine whether the grounds for appeal have been satisfied and whether further process is necessary to resolve the appeal. Findings of fact will be accepted as determined by the original adjudicating body, unless the appellate body determines that the original adjudicating body acted in an arbitrary, capricious, or unfair manner.
6. The appellate body will make a decision based on the written submissions within 20 calendar days, or indicate in writing what further process is necessary for final resolution.
7. The appellate body may approve, reject, or modify the decision and sanction in question. The action taken shall be communicated in writing to the student, the Faculty member, and the original adjudicating body within 20 calendar days after receipt of the appeal and related documents. The decision of the appellate body is final.

6. Maintenance of Records

Graduate Division shall serve as the central location where all written, audio, and electronic records of incidents of academic misconduct are kept on file. The records will be readily available for review by the Deans and Associate Deans of each College or School, the Dean of the Graduate Division, the Executive Vice Chancellor and Provost, and the Vice Provost for Conflict Resolution, in accordance with legitimate educational interest criteria as articulated by the Family Educational Rights and Privacy Act.

The file of a student found in violation of campus regulations (including the transcripts or recordings of the hearing) will be maintained for a period of at least seven years from the date of the letter providing notice of final disciplinary action, unless otherwise determined by the Associate Dean for Graduate Academic Affairs. When a student is suspended as a result of a violation of the University of California Policy on Student Conduct and Discipline, the fact that suspension was imposed must be posted on the academic transcript for the duration of the suspension. When a student is dismissed, the fact that dismissal was imposed must be posted on the academic transcript permanently.

Campus Policies and Regulations

Student Conduct and Responsibility

Students enrolling in the university assume an obligation to conduct themselves in a manner compatible with the university's function as an educational institution. Students shall refrain from conduct which interferes with university teaching, research, administration, or the university's subsidiary responsibilities, or which endangers the health or safety of members of the university community or of visitors to the campus, and from disorderly conduct on university premises or at university-related events.

In cases of student misconduct, the student's College Executive Committee may defer or withhold their degree for a specified period of time. The Dean of Students may recommend such an action to the College Executive Committee.

By authority of the Board of Regents, the Chancellor is entrusted with full power to act in the administration of student discipline. Rules concerning student conduct, student organizations, use of university facilities and related matters are set forth in both university policies and campus regulations, copies of which are available upon request at the Vice Chancellor, Student Affairs office, Student Conduct and Academic Integrity Programs, or at **conduct.ucr.edu**.

Particular attention is called to the *University of California Policies Applying to Campus Activities, Organizations, and Students* and to the campus regulations implementing them. The UCR Student Conduct Procedures are also available in the Vice Chancellor, Student Affairs office.

Standards of Conduct

Chancellors may impose discipline for the commission or attempted commission (including aiding or abetting in the commission or attempted commission) of the following types of violations by students, as well as such other violations as may be specified in campus regulations:

102.01 All forms of academic misconduct including but not limited to cheating, fabrication, plagiarism, or facilitating academic dishonesty.

102.02 Other forms of dishonesty including but not limited to fabricating information, furnishing false information, or reporting a false emergency to the University.

102.03 Forgery, alteration, or misuse of any University document, record, key, electronic device, or identification.

102.04 Theft of, conversion of, destruction of, or damage to any property of the University, or any property of others while on University premises, or possession of any property when the student had knowledge or reasonably should have had knowledge that it was stolen.

102.05 Theft or abuse of University computers and other University electronic resources such as computer and electronic communications facilities, systems, and services. Abuses include (but are not limited to) unauthorized entry, use, transfer, or tampering with the communications of others; interference with the work of others and with the operation of computer and electronic communications facilities, systems, and services; or copyright infringement (for example, the illegal file-sharing of copyrighted materials).

Use of University computer and electronic communications facilities, systems, or services that violates other University policies or campus regulations.

Please refer to the **UC Electronic Communications Policy** and Digital **Copyright Protection at UC** for the University's position on digital copyright.

102.06 Unauthorized entry to, possession of, receipt of, or use of any University services; equipment; resources; or properties, including the University's name, insignia, or seal.

102.07 Violation of policies, regulations, or rules governing University-owned, -operated, or -leased housing facilities or other housing facilities located on University property.

102.08 Physical abuse including but not limited to physical assault; threats of violence; or other conduct that threatens the health or safety of any person.

Sexual Violence (including Sexual Assault – Penetration, Sexual Assault – Contact and Relationship Violence) is defined by the University of California Policy on Sexual Violence and Sexual Harassment (**policy.ucop.edu/doc/4000385/SVSH**). Please refer to 102.26.

102.09 Harassment, defined as conduct that is so severe and/or pervasive, and objectively offensive, and that so substantially impairs a person's access to University programs or activities that the person is effectively denied equal access to the University's resources and opportunities.

Harassment based on a protected category is defined by the University of California Anti-Discrimination Policy. Pursuant to section 104.90, sanctions may be enhanced for conduct motivated on the basis of the protected categories defined in the University of California Anti-Discrimination Policy. (**policy.ucop.edu/doc/1001004/Anti-Discrimination**) Please refer to 102.27.

Sexual Harassment is defined by the University of California Policy on Sexual Violence and Sexual Harassment (**policy.ucop.edu/doc/4000385/SVSH**). Please refer to 102.26.

102.10 Stalking behavior in which a student repeatedly engages in a course of conduct directed at another person and makes a credible threat with the intent to place that person in reasonable fear for his or her safety, or the safety of his or her family; where the threat is reasonably determined by the University to seriously alarm, torment, or terrorize the person; and where the threat is additionally determined by the University to serve no legitimate purpose.

Stalking of a sex-based nature is defined by the University of California Policy on Sexual Violence and Sexual Harassment (**policy.ucop.edu/doc/4000385/SVSH**). Please refer to 102.26.

102.11 (deleted on October 9, 2009)

102.12 Participation in hazing or any method of initiation or pre-initiation into a campus organization or other activity engaged in by the organization or members of the organization at any time that causes, or is likely to cause, physical injury or personal degradation or disgrace resulting in psychological harm to any student or other person.

Participation in hazing or any intentional, knowing, or reckless act, activity, or method committed by a person (whether individually or in concert with other persons) against another person or persons, including current, former or prospective students, regardless of the willingness of such other person or persons to participate, that is committed in the course of a pre-initiation, an initiation into, an affiliation with, or the maintenance of membership in, an official or unofficial student organization or other student group that:

i. causes or creates a risk, above the reasonable risk encountered in the course of participation in the institution of higher education or the organization (such as the physical preparation necessary for participation in an athletic team), of physical or psychological injury, including personal degradation or disgrace, and/or
ii. the person knew or should have known was likely to cause serious bodily injury.

102.12.1 Prohibited hazing includes (but is not limited to) the aiding or abetting in the commission or attempted commission of hazing, or the obstruction or attempted obstruction of any investigation (including during disciplinary hearings) of any hazing activity, any of which may result in discipline up to and including suspension or dismissal. Students who are aware of the occurrence of hazing are encouraged to take action to discourage it. Failure to report hazing is considered to constitute permission, contribution, or encouragement of hazing and is not permitted and may result in discipline up to and including suspension or dismissal.

Revision approved April 25, 2021

102.13 Obstruction or disruption of teaching, research, administration, disciplinary procedures, or other University activities.

102.14 Disorderly or lewd conduct.

102.15 Participation in a disturbance of the peace or unlawful assembly.

102.16 Failure to identify oneself to, or comply with the directions of, a University official or other public official acting in the performance of his or her duties while on University property or at official University functions; or resisting or obstructing such University or other public officials in the performance of or the attempt to perform their duties.

102.17 Unlawful manufacture, distribution, dispensing, possession, use, or sale of, or the attempted manufacture, distribution, dispensing, or sale of controlled substances, identified in federal and state law or regulations.

102.18 Manufacture, distribution, dispensing, possession, use, or sale of, or the attempted manufacture, distribution, dispensing, or sale of alcohol that is unlawful or otherwise prohibited by, or not in compliance with, University policy or campus regulations.

102.19 Possession, use, storage, or manufacture of explosives, firebombs, or other destructive devices.

102.20 Possession, use, or manufacture of a firearm or other weapon as prohibited by campus regulations.

102.21 Violation of the conditions contained in the terms of a disciplinary action imposed under University Policies Applying to Campus Activities, Organizations and Students ("PACAOS")" or campus regulations.

102.22 Violation of the conditions contained in a written Notice of Emergency Suspension issued pursuant to Section 53.00 of PACAOS or violation of orders issued pursuant to Section 52.00 of PACAOS, during a declared state of emergency (**policy.ucop.edu/doc/2710525/PACAOS-50**).

102.23 Selling, preparing, or distributing for any commercial purpose course lecture notes or video or audio recordings of any course unless authorized by the University in advance and explicitly permitted by the course instructor in writing. The unauthorized sale or commercial distribution of course notes or recordings by a student is a violation of University Policies Applying to Campus Activities, Organizations and Students ("PACAOS")" whether or not it was the student or someone else who prepared the notes or recordings.

Copying for any commercial purpose handouts, readers or other course materials provided by an instructor as part of a University of California course unless authorized by the University in advance and explicitly permitted by the course instructor or the copyright holder in writing (if the instructor is not the copyright holder).

102.23.1 Copying, posting or distributing materials provided by an instructor for any noncommercial purpose.

102.24 Conduct, where the actor means to communicate a serious expression of intent to terrorize, or acts in reckless disregard of the risk of terrorizing, one or more University students, faculty, or staff. 'Terrorize' means to cause a reasonable person to fear bodily harm or death, perpetrated by the actor or those acting under his/her control. 'Reckless disregard' means consciously disregarding a substantial risk. This section applies without regard to whether the conduct is motivated by race, ethnicity, personal animosity, or other reasons. This section does not apply to conduct that constitutes the lawful defense of oneself, of another, or of property.

102.25 Making a video recording, audio recording, taking photographs, or streaming audio/video of any person in a location where the person has a reasonable expectation of privacy, without that person's knowledge and express consent.

Looking through a hole or opening, into, or otherwise viewing, by means of any instrumentality, the interior of a private location without the subject's knowledge and express consent.

Making a video recording, audio recording, or streaming audio/video of private, non- public conversations and/or meetings, without the knowledge and express consent of all recorded parties.

These provisions do not extend to public events or discussions, nor to lawful official law or policy enforcement activities. These provisions may not be utilized to impinge upon the lawful exercise of constitutionally protected rights of freedom of speech or assembly.

Definitions

"Express consent" is clear, unmistakable and voluntary consent that may be in written, oral or nonverbal form.

"Private locations" are settings where the person reasonably expected privacy. For example, in most cases the following are considered private locations: residential living quarters, bathrooms, locker rooms, and personal offices.

"Private, non-public conversations and/or meetings" include any communication carried on in circumstances that reasonably indicate that any party wants the communication to be confined to the parties, but excludes a communication made in a public gathering, or in any

other circumstance in which the parties to the communication may reasonably expect that the communication may be overheard or recorded.

Invasions of Sexual Privacy are defined by the University of California Policy on Sexual Violence and Sexual Harassment (policy.ucop.edu/doc/4000385/SVSH). Please refer to 102.26

102.26 Violation of the University of California Policy on Sexual Violence and Sexual Harassment.

102.27 Violation of the University of California Anti-Discrimination Policy.

102.28 Violation of local, state, or federal laws, regulation or ordinance not otherwise covered under these standards of conduct.

102.29 Violation of any other University policy or campus regulation not otherwise covered by these standards of conduct.

102.30 Violating health and safety requirements issued by the University and/or local, state or federal governments in response to public health emergencies (e.g. COVID-19).

Speech and Assembly

UCR's Time, Place, and Manner regulations identify the allowable parameters of expressive activities on campus. Key provisions include:

- Expressive activities generally are not permitted inside buildings except with prior authorization
- Expressive activites may not block, obstruct or limit the free movment of people on campus
- People may not conceal their identity for the purpose of evading or escaping discovery, recognition, or identification in the commission of violation of applicable policies or laws

Conduct policies and other rules also apply to expressive activities. Students are encouraged to reviwe UCR's free speech websites: freespech.ucr.edu/senate-bill-108 and freespeech.ucr.edu.

Substance Abuse

UCR is committed to achieving and maintaining a campus community that fosters personal and institutional excellence and strives to provide conditions under which the work of the university can go forward freely, with the highest standards of quality and institutional integrity. In keeping with this commitment, each student should help to create a campus community that is free from the problems of substance abuse and dependency.

UCR distributes to all students and employees via email at least annually Alcohol/Drug Abuse Prevention Information. This notification is made pursuant to the federal Drug-Free Schools and Communites Act. This information is available in the Annual Security and Fire Safety Report, available at compliance.ucr.edu/clery-act-compliance. Information includes university and campus policies, applicable laws, and the penalties and sanctions for violations.

Anti-Discrimination Policy and Grievance Procedures

The University of California, in accordance with applicable Federal and State law and University policy, does not discriminate based on any Protected Category. A Protected Category is an identity protected by law, including:

- Race, color, or ethnic origin
- Citizenship, national origin, or ancestry (including caste)
- Religion
- Sex (including pregnancy, childbirth, lactation or related medical conditions), gender, gender identity, gender expression, gender transition, sexual orientation or marital status
- Physical or mental disability, medical condition (cancer related or genetic characteristics),
- Age
- Veteran or military status.

UCR protects students from antisemitism, which may constitute harassment based on national or ethnic origin or ancestry.

The Anti-Discrimination policy prohibits harassment, defined as is unwelcome conduct based on an individual's actual or perceived Protective Category that is sufficiently severe, persistent, or pervasive that it unreasonably interferes with, denies, or adversely limits an individual's participation in or benefit from the education, employment, or other programs or activities of the University, and creates an environment that a reasonable person would find to be intimidating or offensive.

Inquiries regarding the University's Anti-Discrimination policies may be directed to the Office of Civil Rights (compliance.ucr.edu/office-civil-rights).

University policy prohibits retaliation for bringing a complaint of discrimination or harassment. University policy also prohibits retaliation against a person who assists with a complaint of discrimination or harassment, or participates in any manner in an investigation or resolution of a complaint of discrimination or harassment.

Students may report or file complaints of discrimination, including harassment, or retaliation to the Office of Civil Rights, at titleix.ucr.edu/reporting. Reports will be processed under UCR's Anti-Discrimination Complaint Resolution Procedure. (More information about sexual violence and sexual harassment is provided in the next section of this Catalog.)

Other options and resources related to complaints and grievances are available through help.ucr.edu.

Note: Grade appeals must be addressed under the procedure established by the UCR Faculty Senate. See Regulation 5 (senate.ucr.edu/regulations).

Students may also file a complaint through the Office of Civil Rights (OCR) of the U.S. Department of Education [Voice: (415) 486-5555; TTY: (877) 521-2172, Email: ocr.sanfrancisco@ed.gov].

Title VI Coordinators

UCR has designated its Assistant Vice Chancellor for Civil Rights to coordinate its efforts to comply with and carry out its responsibilities under Title VI of the Civil Rights Act of 1964 – an important federal law protecting students from discriminiation.

Holly Hare, Assistant Vice Chancellor and Local Implementation Officer
Email: titleix@ucr.edu
compliance.ucr.edu/office-civil-rights

Sexual Violence and Sexual Harassment Policy and Grievance Procedure

UCR is committed to fostering an environment where all UCR students can work and learn in an atmosphere that is inclusive, safe, and rewarding in an atmosphere that is free from all forms of sex- and gender-based harassment, including sexual violence. The UC Policy on Sexual Violence and Sexual Harassment prohibits sexual harassment, including sexual assault, relationship violence and stalking, and protects those who report sexual harassment (or engage in other protected activites) from retaliation. The policy applies to all students, faculty, and staff. The campus will respond promptly to all reports of sexual harassment involving UCR students, and will take appropriate action to address prohibited behavior and to provide supportive services to those affected by sexual harassment.

You are strongly encouraged to review and become familiar with UCR's Policies and Procedures which are available through the Office of Civil Rights, at titleix.ucr.edu.

For information, assistance, or to explore options for addressing sexual harassment and sexual violence, or to make a report contact:

Title IX Coordinators

UCR has designated the following employees to coordinate its efforts to comply with and carry out its responsibilities under Title IX of the Education Amendments of 1972 and implementing regulations, including investigation of complaints:

Holly Hare, Assistant Vice Chancellor and Title IX Officer
Email: titleix@ucr.edu
Phone: (951) 827-7070

Disability Discrimination Grievance Procedure

The University of California, Riverside (UCR) is committed to full compliance with laws and policies protecting individuals with disabilities. As described above (under Anti-Discrimination Policy and Grievance Procedures), discrimination or harassment on the basis of disability is prohibited.

Resolving a Grievance

In addition to the grievance options described under the Anti-Discrimination Policy and Grievance Procedures, above, students have the additional options to address concerns regarding disability discrimination:

- Consult with the ADA Coordinator: The ADA/Section 504 Coordinator may assist in resolving the matter, or can identify the appropriate complaint procedure depending on the nature of the concern.

  Kiersten Boyce, ADA/504 Coordinator
  Email: titleix@ucr.edu
  Phone: (951) 827-7070

- Student Accommodations: Contact the Director of the Student Disability Resource Center.

  Laura Riley, Director
  Email: laura.riley@ucr.edu
  Phone: (951) 827-5379
  Website: sdrc.ucr.edu

Retaliation

University policy prohibits retaliation for bringing a complaint of discrimination or harassment. University policy also prohibits retaliation against a person who assists with a complaint of discrimination or harassment, or participates in any manner in an investigation or resolution of a complaint of discrimination or harassment.

Anti-Hazing

Hazing is prohibited by state and federal laws, and University of California policy, which states that participation in hazing or any intentional, knowing, or reckless act, activity, or method committed by a person (whether individually or in concert with other persons) against another person or persons, including current, former, or prospective students, regardless of the willingness of such other person or persons to participate, that is committed in the course of a preinitiation, an initiation into an affiliation with, or the maintenance of membership in, an official or unofficial student organization or other student group that

i. causes or creates a risk, above the reasonable risk encountered in the course of participation in the institution of higher education or the organization (such as the physical preparation necessary for participation in an athletic team), of physical or psychological injury, including a person degradation or disgrace, and/or
ii. the person knew or should have known was likely to cause serious bodily injury.

If you have been hazed, have witnessed hazing, or suspect that someone you know has been hazed, you can report, including anonymously, to UCR officials via the form or phone numbers listed at deanofstudents.ucr.edu/policies-and-procedures/hazing. Other policies/laws regarding hazing, and the process used to investigate reports and adjudicate alleged violations, are also described here, together with resources for hazing prevention and response. Students who are found responsible for violating the Standards of Conduct will be assigned sanctions, up to and including Suspension or Dismissal from the University of California.

E-mail and Computer Expectation Policy

The primary mode of campus communication is e-mail, and it is therefore mandatory for students to utilize their UCR Webmail accounts to review academic and administrative electronic correspondence. UCR strongly recommends that all students have a computer with Internet access. UCR faculty will assume students have such access, and academic work may require it. The UCR administration will also assume that students have Internet access, and many administrative tasks may require students to use the Internet. For information concerning computer acquisition, student network access, student computing laboratories, and student computer support, visit UCR's Student Technology Support Web, its.ucr.edu/sts.

Fees

Students are expected to pay all fees and charges which they incur. Those with outstanding obligations to the university are not allowed to register or participate in certain university services.



UNDERGRADUATE STUDIES

Goals of an Undergraduate Education

The faculty of UCR hereby declare the following set of general educational goals to be pursued through our individual and collective efforts in teaching and guiding the undergraduates of this campus.

A university education must help students realize their potential as individuals and contributing participants in society. This involves the acquisition of knowledge and skills, as well as preparation for future responsibilities.

A general education provides a framework that enables one to appreciate and critically examine the significant aspects of civilization. This framework is derived from the study of world history; political and economic systems; the ethnic, cultural, and religious diversity of the peoples of the Earth; the arts and letters of all cultures; the social and natural sciences; and technology. Such a broad education is the foundation for concentrated studies that enable students to prepare for careers and to strive for an understanding of the world in which they live and about which they must make decisions.

A university education nurtures the critical skills of oral and written communication, including the exercise of these skills in a language other than one's own. It must teach students to become verbally and quantitatively literate, to analyze and synthesize, and to regard the acquisition of knowledge as a lifetime activity. A university education must promote tolerance of the opinions of others and an understanding of the mutual dependence of human beings on each other and on their natural environment. The student's university years also provide an opportunity to develop integrity, self-esteem, self-discipline, style, humanness, commitment to the general welfare, sensitivity to the interplay of environment and technology, and confidence that the human drama is worthy of a lengthy future.

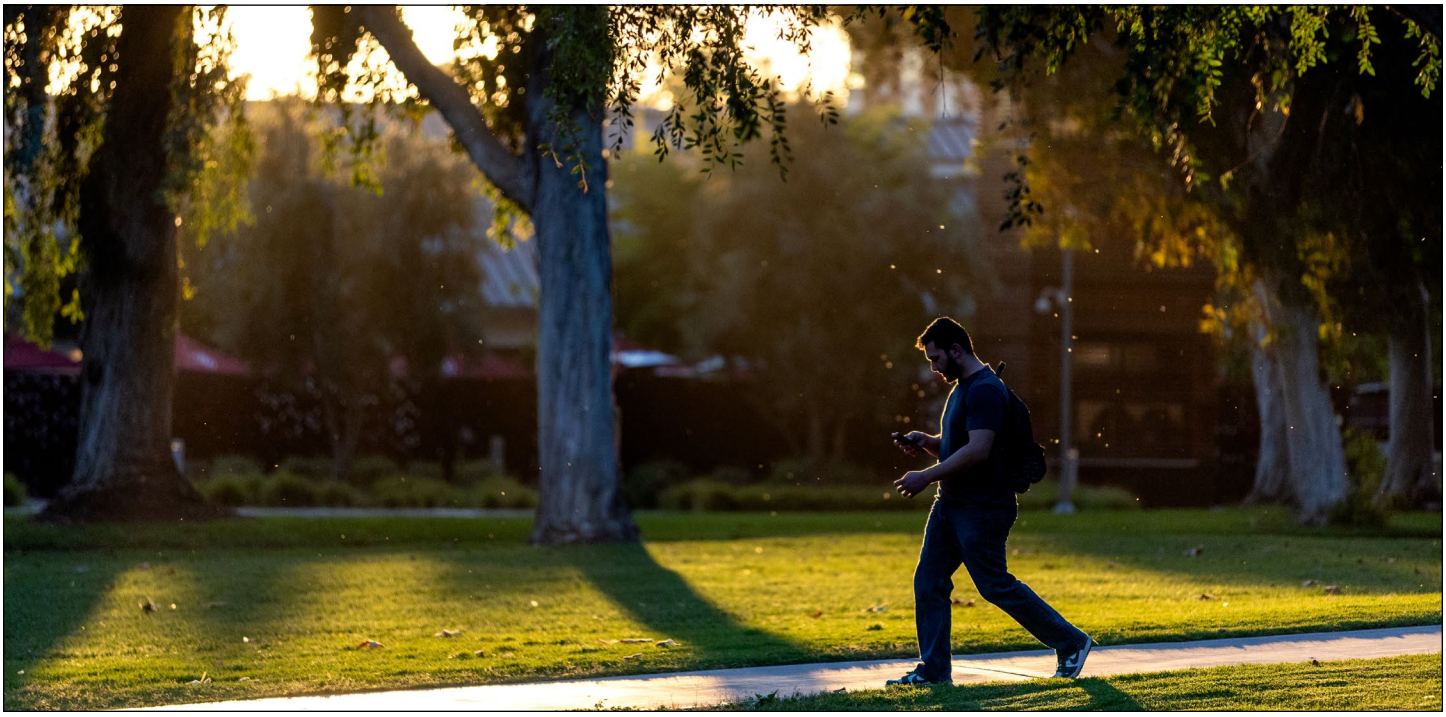
UCR has three undergraduate colleges and three undergraduate schools that offer bachelor's degrees: Humanities, Arts, and Social Sciences; Natural and Agricultural Sciences; and Engineering. UCR also has the School of Business, School of Education, and the School of Public Policy that offer bachelor's degrees.

Requirements for the Bachelor's Degree

Requirements for the bachelor's degree vary according to the college and major selected. There are three kinds of requirements: general university, college, and major.

1. General University requirements
    - Entry-Level Writing
    - American History and Institutions
    - Unit
    - Scholarship
    - Residence
2. College breadth requirements
    - English Composition
    - Humanities
    - Social Sciences
    - Ethnicity
    - Foreign Language
    - Natural Sciences and Mathematics
    - Additional Courses
3. Major requirements
    - Lower-Division or Core Courses
    - Upper-Division Courses

Students should plan a program of study carefully and consult an academic advisor. Students are responsible for meeting all requirements for graduation.



General University Requirements

General university requirements are university-wide requirements that all undergraduates must satisfy. The following regulations and requirements are applicable to all undergraduate students on the Riverside campus.

University of California Entry-Level Writing Requirement

All university faculty assume that students are proficient in reading and writing English, and that they understand how to compose an essay on an academic topic. For this reason, students are asked to provide proof of their writing ability on entering the university.

Completion of the UC Entry-Level Writing Requirement is a prerequisite to WRIT 010 and WRIT 010S. The UC Entry-Level Writing Requirement may be completed after enrollment in the university by passing an Entry-Level Writing Requirement course as directed by the University Writing Program (see below). It may be completed before enrollment in any one of the following ways:

1. Receiving a score of 680 or better on the College Board SAT Reasoning Test, Writing test (last administered January 2016).
2. 680 or better on the SAT, Evidence-Based Reading and Writing section of paper-and-pencil SAT (offered prior to March 2024). Scores from the digital SAT are not approved to satisfy the ELWR.
3. Achieving a score of 30 or better on the ACT, English Language Arts test.
4. Achieving a score of 30 or better on the ACT, Combined English/Writing test (last administered June 2015).
5. Achieving a score of 63 or better on the ACT, English plus Reading.
6. Receiving a score of 3, 4, or 5 on the College Board Advanced Placement Test in English (Language and Composition or English Literature and Composition). In addition to fulfilling the UC Entry-Level Writing Requirement, a score of 3 satisfies the WRIT 010/WRIT 010S requirement; a score of 4 or 5 satisfies the WRIT 010/WRIT 010S and WRIT 020/WRIT 020S requirements.
7. Receiving a score of 3, 4, or 5 on the College Board Advanced Placement test in Seminar.
8. Receiving a score of 3, 4, or 5 on the College Board Advanced Placement assessment in Research.
9. Receiving a score of 5, 6, or 7 on an International Baccalaureate Higher Level English A: Literature exam (formerly known as Higher Level English A1 exam).
10. Receiving a 6 or 7 on an International Baccalaureate Standard Level English A: Literature exam (formerly known as Standard Level English A1 exam).
11. Receiving a 5, 6, or 7 on an International Baccalaureate Higher Level English A: Language and Literature exam.
12. Receiving a 6 or 7 on an International Baccalaureate Standard Level English A: Language and Literature exam.
13. Completion with a grade of "C" or better of a 4 quarter unit or 3 semester unit college-level course in English composition, taken at another institution before the student enters the university and judged acceptable by the Office of Undergraduate Admissions.
14. Receiving a passing score on the Writing Placement Process diagnostic essay exam.

All incoming freshmen who have not met the UC Entry-Level Writing Requirement and are entering in the fall quarter must complete the Writing Placement Process.

The diagnostic essay exam is administered by the University Writing Program. Students may select to complete the Writing Placement Process on one of multiple test dates leading up to the start of the fall quarter.

For more information, see https://admission.universityofcalifornia.edu/elwr/ or https://uwp.ucr.edu/elwr#wpp.

Students also have an opportunity to satisfy the requirement in UCR's summer sessions by passing ENGL 004 before they become full-time students in the fall. They can also take a pre-WRIT 010 (formerly ENGL 001A) class during the summer at a local college or university before they become full-time students at UCR. Students taking pre-WRIT 010 summer courses not at UCR can then retake the Writing Placement Process for a second time at UCR right before fall quarter classes begin.

Students who have not met the requirement upon entrance to UCR are placed into one of the following UCR courses of instruction. Placement in these courses is determined by the Director of the University Writing Program and is based on the student's performance on the Writing Placement Process diagnostic essay exam.

1. WRIT 001
2. WRIT 003
3. WRIT 005
4. WRIT 007 (formerly ENGL 004)

To pass the Entry-Level Writing Requirement (once enrolled as full-time students), students must earn a course grade of "C" (2.0) or better in WRIT 007 or WRIT 009.

According to systemwide regulations, any student who has not satisfied the Entry-Level Writing Requirement after three quarters of university residence (three quarters of enrollment during the regular academic year) is not normally eligible to enroll for a fourth quarter at the University of California. (For students placed in WRIT 001, WRIT 003, or WRIT 005, this three-quarter residence rule begins after satisfactory completion of WRIT 005 or at the start of their fourth quarter of regular enrollment at UCR, whichever comes first.) Students are encouraged to complete the requirement as soon as possible in their first year.

American History and Institutions

Candidates for a bachelor's degree must satisfy the requirement in American History and Institutions by demonstrating a knowledge of American history and of American political institutions and ideals. The requirement may be satisfied by satisfactory completion of any one of the following:

1. One (1) high school unit in American History, or 1/2 high school unit in American History and 1/2 high school unit in civics or American Government
2. The requirement in a junior college or other accredited institution
3. One college course in the field of American History or one college course in the field of American Government. UCR courses that fulfill this requirement are HIST 017A or 017B, POSC 010, POSC 100, and POSC 113

Students applying for one of the teacher credential programs should check with the School of Education concerning limitations on ways of meeting this requirement.

Unit Requirement

A minimum of 180 units of academic work with a grade point average of 2.00 in all courses undertaken in the UC is required for graduation.

Not more than 6 units of physical education activities courses, no 400 series course, and not more than three courses in the 300 series may be counted toward the 180 unit requirement.

Scholarship Requirement

To receive a bachelor's degree, students must obtain twice as many grade points as units (2.00 grade point) for all courses attempted in the university. An exception to this rule is made for those students undertaking certain honors courses.

Residence Requirement

The minimum residence at the UC required for a degree is three quarters. One of the three quarters may be completed in a UCR summer session in which the student carries 12 units, unless a reduced load is approved in advance by the dean of the student's college.

Courses completed in UC Extension are not considered work in residence, even if taken through concurrent enrollment.

Thirty-five (35) of the final 45 units must be earned in residence in the student's college (this does not preclude the student from taking courses in other colleges on campus). For students who are enrolled in the Education Abroad Program, UC Washington Center (UCDC) or UC Center Sacramento (UCCS) programs, 35 of the final 90 units, including the final 12 units, must be earned in residence. Eighteen (18) of the 35 units may be completed in summer session courses on the Riverside campus.

With the approval of the dean of a student's college or school, a candidate for the bachelor's degree who was in active service in the armed forces of the United States in the year preceding the awarding of the degree may be recommended for the degree after only one quarter of university residence in which the candidate completes at least 16 units or passes a comprehensive examination in the major or field of concentration.

College Breadth Requirements

Each college has established additional requirements for a degree. The requirements of the colleges at Riverside are designed to stimulate an interest in areas of knowledge not necessarily related to a student's major field. Students should note that they consist of a certain number of units and courses covering a variety of fields. Although these requirements determine a large and important part of the four-year curriculum, there are opportunities for students in all departments to do special, independent work.

The main objective of the colleges on the Riverside campus is to provide a setting within which students may develop those qualities of mind and character necessary to intellectual advancement and to useful membership in society. The major areas of human knowledge form the substance of the colleges on the Riverside campus: the College of Humanities, Arts, and Social Sciences; the College of Natural and Agricultural Sciences; The Marlan and Rosemary Bourns College of Engineering; The School of Business; The School of Education and The School of Public Policy. The breadth requirements for the colleges are similar; however, refer to each college's section for a detailed discussion of its requirements.

Courses taken in a student's major discipline (including courses cross-listed with the major discipline) may not be applied toward satisfaction of the Humanities, Social Sciences, Ethnicity, or the Natural Sciences and Mathematics requirements except for Biology majors in connection with the Biological Sciences requirement, English majors in connection with the English Composition requirement, History majors in connection with the World History requirement, Ethnic Studies majors in connection with the Ethnicity requirement, Foreign Language majors in connection with language requirements, and students permitted by their college to take a Senate-approved alternative to English 1C in order to satisfy the third-quarter writing requirement. However, courses outside the major discipline, but required for the major, may be applied toward satisfaction of these requirements. Students are urged to make sure that they understand which courses are permitted to satisfy more than one requirement. Information on specific degree requirements and courses is available in the academic advising office in each college.

Placement exams may be required before a student takes courses in certain subjects, such as foreign languages and mathematics. Foreign language placement exams are required before students register for courses in the language that they took in high school or have some experience with the language. Students are only allowed one placement exam per applicable language. For foreign languages, a sufficiently high score on the UCR placement exam can fulfill the Foreign Language requirement. Students who are required to take math courses, will need to complete the Math Placement Assessment (MPA) or have met the math prerequisites before registering. Please refer to the MPA website at https://arc.ucr.edu/mpp for placement information.

For details about the UC policy on intercampus reciprocity of breadth requirements and the UC policy on the Intersegmental General Education Transfer Curriculum, see below.

Intercampus Reciprocity Policy Regarding Breadth/General Education Requirements

Students who transfer from one UC campus to another and who have completed the Breadth/General Education (B/GE) requirements of the campus from which they have transferred (except for upper-division B/GE requirements) will be considered to have met the B/GE requirements of the campus to which they transfer.

Courses taken for B/GE requirements at the campus from which they transfer will be accepted toward the appropriate B/GE requirements of the campus to which they transfer.





California General Education Transfer Curriculum (Cal-GETC)

The California General Education Transfer Curriculum (Cal-GETC) is the singular general education pathway for California community college students to fulfill lower-division general education requirements necessary for transfer and admission to the UC or California State University. The Cal-GETC program is administered through the California community college system. Completion of the Cal-GETC must be certified by a community college counselor and submitted to UCR with the student's final transcript.

The Cal-GETC is accepted for all majors at UCR. Intersegmental General Education Transfer Curriculum (IGETC) will continue to be accepted in lieu of Cal-GETC. All students should ensure that their certified Cal-GETC has been received during their first quarter of attendance at UCR.

Although the Bourns College of Engineering (BCOE), College of Humanities, Arts, and Social Sciences (CHASS), and College of Natural and Agricultural Sciences (CNAS) accepts completion of Cal-GETC as satisfying the majority of the college's breadth requirements for transfer students, some additional breadth coursework may be required after enrollment. Prospective applicants are strongly encouraged to focus on preparatory course work for their desired major, such as mathematics, science, and other technical preparatory course work, rather than on Cal-GETC completion.

Major Requirements

A major is a coordinated group of upper-division courses giving depth to a student's work in a chosen area. A list of degrees offered and possibilities for establishing individual majors are described in each college section below. Degrees are also listed in the front of the catalog. A student should choose a major not later than the beginning of the junior year. However, a choice of major before that time facilitates program planning in most academic fields.

The departmental major represents advanced and relatively specialized work in one of the academic disciplines in the college. The interdepartmental or nondepartmental major is broader in scope and usually based upon two or more disciplines. The individual major is designed for the student who has an unusual but definite academic interest for which no suitable major is offered.

Major requirements are described in detail in the Programs and Courses section of this catalog under the department or program offering the major.

The responsibility for fulfillment of all degree requirements — general university, college, and major — rests with the student. Students are urged, however, to seek program counseling with appropriate advisors.

Assignment to a major or to the undeclared category (open to first-year and sophomore students) is based on the student's choice indicated on the Application for Admission. The student should enroll in accordance with this choice; changes may be made following course enrollment.

Change of Major

Students may transfer from one major to another, elect a double major within their college, or add a second major in another college by filing a declaration. Students must be in good academic standing and meet eligibility requirements to change or add majors.

DIVISION OF UNDERGRADUATE EDUCATION

Louie F. Rodriguez, Vice Provost and Dean
Vice Provost/Dean's Office
Student Services Building #2106
(951) 827-7750
ue.ucr.edu

The Division of Undergraduate Education (DUE) collaborates with the UC Riverside campus community to create transformative, equity-driven academic opportunities for student learning, building, and thriving. UE is focused on the student experience and student outcomes. More specifically, UE is committed to elevate high achievers through the Honors Program; connect students to research, scholarships and other academically-driven enrichment experiences; and strengthening students' skills, knowledge and readiness through the Academic Resource Center (ARC). Additionally, DUE promotes students' various forms of literacies in the Undergraduate Writing Program (UWP) and the promotion of health professions through the Health Professions Advising Center (HPAC).

DUE is responsible for the following student programs and services. These programs and services are categorized as Academic Programs, CUREL, and Student Success.

Academic Programs

The Division of Undergraduate Education's Academic Programs are designed to promote student brilliance at UC Riverside and leverage high-impact practices, polices, and initiatives that are meaningful to all students, our communities, and society.

University Honors

381 Skye Hall
(951) 827-5323
honors.ucr.edu

University Honors engages a diverse community of students, faculty, and staff in the creation of global citizens through high-impact experiences that emphasize original scholarship, contribution, creativity, and innovation. Admission to University Honors is by invitation only. The University Honors Faculty Admissions Committee strives to admit a dynamic and well-rounded group of scholars each year who will contribute to every aspect of the University Honors community. Students must demonstrate strong academics; exemplary writing skills; interest in research, scholarly pursuits, or creative work; leadership qualities; and community involvement.

University Writing Program (UWP)

1003 HMNSS
(951) 827-1384
uwp.ucr.edu

The University Writing Program (UWP) offers courses that fulfill the UC Entry Level Writing Requirement and the UCR English Composition breadth requirement. These courses are designed to help students write effectively in other University courses and later in their professional lives. University writing demands the ability to read carefully, to analyze what is read, and to draw conclusions about those data for both general and expert audiences. Our courses help students learn to write well, read closely, and speak formally in public.

Center for Undergraduate Research and Engaged Learning (CUREL)

Director: Gladis Herrera-Berkowitz
Student Services Building #2106
(951) 827-7389
engage.ucr.edu

The Center for Undergraduate Research and Engaged Learning (CUREL) seeks to enrich UC Riverside undergraduate academic experience through high-impact programs. As a unit of Undergraduate Education, the Center's programs focus on leadership, fellowships and national awards, undergraduate research, community service and engaged learning, capital internships, and other strategic initiatives for the benefit of student experience.

CUREL Programs

Capital Internships (UCCS + UCDC)
UC Center in Sacramento (UCCS) and UC Washington Center (UCDC) combine coursework and professional experience while living, interning, and attending classes in Sacramento or Washington, D.C.

Chancellor's Research Fellowship (CRF)
The Chancellor's Research Fellowship (CRF) is a competitive award that supports undergraduates in faculty-mentored research and creative activity projects. This award is open to students in all disciplines.

Community Engaged Learning
Community engagement allows students to conduct faculty-mentored research in the support of the community. Additionally, students can connect with on and off-campus departments and non-profit organizations for volunteer opportunities to help them engage in the community, and group service events.

EXCEL+ Career Readiness and Leadership
The EXCEL+ Career Readiness and Leadership program is designed to assist UC Riverside students in articulating skills obtained through participation in courses, high-impact programs and extracurricular activities.

Global Career Accelerator
An innovative, online experiential program offering students the opportunity to develop global competencies and gain real-world work experience. Participants collaborate with peers from 50+ countries on projects for leading companies like Spotify, Netflix, Intel, and the GRAMMYs. Students can earn up to 8 academic credits and 4 micro-credentials focused on key industry tools. The flexible, virtual format prepares students for success in today's global, remote, and hybrid work environments.

Mini-Grants
CUREL offers mini-grants to enable undergraduates to participate in faculty-mentored research and creative projects of their own design as well as student travel to present their research at conferences.

Prestigious Scholarships
CUREL supports students in applying for national and international awards by providing guidance on these opportunities. Professional staff provides targeted writing support to students applying for prestigious scholarships/fellowships, undergraduate research and journal submissions.

R'Courses
1 unit, S/NC course offerings facilitated by UC Riverside undergraduate students that design and lead their own original courses. Each course has a faculty instructor of record who provides mentoring and support behind the scenes. Students develop leadership skills, to innovate the undergraduate curriculum, and to promote democratic, experience-based education to campus.

Tilga Scholarship
The Tilga Scholarship provides financial support to UCR undergraduate students pursuing unpaid internship opportunities. This scholarship is designed to reduce financial barriers and promote equitable access to experiential learning. Ideal applicants will demonstrate a strong commitment to their professional development. Preferential consideration is given to students participating in the EXCEL+ Leadership and Career Readiness Program.

Undergraduate Research Journal
The Journal provides a student-edited multi-disciplinary journal that features the very best faculty-mentored undergraduate research and scholarship accomplished on our campus. Professional staff provides targeted writing support for journal submissions.

Undergraduate Research Symposium
The Undergraduate Research & Creative Activities Symposium celebrates undergraduate research and creative activities across all disciplines at UC Riverside, and provides a positive learning experience for presenters and guests.

uResarch Portal
The uResearch Portal is a one-stop shop for students to find opportunities to participate in faculty-mentored research, scholarship, and creative activities.

Student Success

Associate Dean of Student Success: Robert Ream

Student Success is here to support students in their academic journey and ensure they are well prepared in the skills of communication, critical thinking, and career readiness. It embraces students' sense of belonging and their engagement in and out of the classroom, including their sense of community.

Academic Resource Center (ARC)

Director: Rena M. Roberts, Ed.D.
Skye Hall, Room 156
(951) 827-3721; arc.ucr.edu

The Academic Resource Center (ARC) provides academic support to all enrolled undergraduate students at UCR with the goal of helping students succeed and excel academically. Programs and services are at no additional cost. unless otherwise noted. See the ARC website for hours of operation and service locations.

In addition to the programs and services listed below, the ARC offers student employment and leadership development opportunities for undergraduate students as peer educators: SI leaders, tutors, peer mentors, math advisory exam and administrative support assistants. Highlander Early Start Academy (HESA) also offers TA positions for graduate students.
ARC programs and services include the following:

Assistance, Coaching & Encouragement (ACE)
Provides individualized support to students who are encountering academic difficulty, helping them to meet satisfactory academic progress requirements. The ACE coaching team is made up of full-time professional staff and peer mentors who are trained and experienced at sorting out the factors that can adversely affect academic performance.

Transfer Success Program
The Transfer Success Program is a support program for incoming and matriculated transfer students. In collaboration with campus wide partners, the program provides programming and connects students to student success services to empower them in their academic, professional, and personal endeavors while assisting students in navigating the university system. The Transfer Student Success Zone located in the ARC, provides a space for transfer students to meet and attend events that address their needs.

Early Assist
The Early Assist program supports first-year students in the Bourns College of Engineering (BCOE) and the College of Natural and Agricultural Sciences (CNAS) who as a result of their score on the Math Placement Assessment (MPA), place into College Mathematics Fundamentals & Problem Solving (Math 3). arc.ucr.edu/early-assist

Highlander Early Start Academy (HESA)
Offers incoming first-year students an opportunity to prepare for the academic rigors and challenges of UCR in the summer before their 1st fall quarter. Students must have placed into English through the Writing Placement Process (WPP), OR Math through the Math Placement Assessment (MPA) to be eligible. HESA participating students will take a primary course (English or Math), a secondary course, and a College Success Course for a total of 8-10 units. The goal of this program is to enhance English & Math skills, support incoming first-year students during the transition from high school to university, connecting them to campus resources for academic and personal success, and helping to build a community with fellow HESA peers. earlystart.ucr.edu; earlystart@ucr.edu

Placement and Advisory Examinations
Used by UCR to assess student readiness for University-level coursework and to determine the appropriate course placement in English, Mathematics, Chemistry, and Foreign Languages. UCR students must satisfy placement requirements before registering for these subjects. Exam results are used for advising and placement purposes only; unit credit cannot be earned with these exams. **There are four placement and advisory exams:**

- Writing Placement Process (WPP) Used to satisfy the University of California Entry Level Writing Requirement (ELWR) and to place first-year students into an appropriate English composition course.
- Math Placement Assessment (MPA) Used to place first-year students into an appropriate Mathematics course.
- California Chemistry Diagnostic Test (CCDT) Optional placement exam that may be used for placement into the First-year Chemistry series.
- Foreign Language Placement Exams Used to determine the appropriate level of Foreign Language entry.

R'Success Workshop Series
The workshop series covers a variety of study and life skills topics aimed at enhancing study and life skills. If you're looking for ways to strength your study habits and time management skills, you've come to the right place. R'success provides students the flexibility to choose workshop sessions on various study and life skills workshops that align with their individual interests and schedule. Receive a stamp for each session you attend (some workshops are worth two (2) stamps); 7 stamps earn you a certificate of completion, an invitation to the Academic Resource Center recognition event held at the end of spring quarter.

Supplemental Instruction (SI)
Peer-led group study to help students succeed in targeted high-priority courses. SI consists of regularly scheduled study sessions, giving students an opportunity to practice and develop academic skills necessary for success. Marketed as "guaranteed study time," SI helps students develop study strategies specific to the course. The goal of SI is to improve academic performance in traditionally difficult courses offered in both lower and upper divisions.

Tutorial Assistance Program (TAP)
The Tutorial Assistance Program (TAP) provides tutoring for a variety of subjects and disciplines, including writing across disciplines. The ARC's trained tutors are mutli-talented and multi-disciplined students that have performed well at the University. Students can utilize tutoring by appointment and on a walk-in basis. Most tutoring is done in small groups with each session lasting for about an hour. Additionally, reading and writing support is offered through consultation and workshops. Writing tutors can provide writing and reading assistance in any academic discipline during any stage of the writing process. The tutoring and workshop schedules can be found on the ARC's website.

ARC's Special Cohort Programs

- **Highlander Early Start Academy (HESA)** is a seven-week intensive in-person program for incoming first-year students. HESA allows students to earn up to 8-10 units before starting their first-year in fall quarter.
- **Math Placement Assessment (MPA)** is used by UC Riverside to assess student readiness in mathematics for University work and to determine the appropriate placement.
- **Early Assist** is a support program for first-year, College of Natural and Agricultural Sciences (CNAS) and Bourns College of Engineering (BCOE) students who have placed into the Math 3. The program follows students as they progress through Math 3 (Fall), Math 6A (Winter) and

Math 6B (Spring) to assist them through the math perquisite series in order to begin the required core STEM courses.

- The **Transfer Success Program** is a support program for incoming and matriculated transfer students to aid in their success. In collaboration with campus wide partners, the program provides programming and connects students to student success services to empower them in their academic, professional, and personal endeavors while assisting students in navigating the university system. The Transfer Success Zone, located in the Academic Resource Center, provides a space for transfer students to meet and attend events that address their needs. arc.ucr.edu/tsp

Black Student Success

Coordinator: Victorino Moreira
Student Services Building #2106
(951) 827-1822
blackstudentsuccess.ucr.edu

Black Student Success engage with Black Scholars (and those scholars with an interest in Black culture and history) at the undergraduate and graduate level to ensure that scholars are accessing the full breadth of academic resources, professional development resources, social-cultural development resources, and wellness resources UC Riverside has to offer. They advocate for Black Scholars (and those scholars with an interest in Black culture and history) on all matters pertaining to their overall wellbeing and comprehensive college experience. Additionally, they collaborate with key UC Riverside staff and faculty to create and facilitate programming practices, and opportunities that utilize the Anti-Deficit Framework to ensure that the needs and aspirations of Black Scholars (and those scholars with an interest in Black culture and history) are both heard and addressed.

All programs and services offered are open to everyone, in accordance with state and federal law and the University of California's nondiscrimination policies.

Pre-Professional Advising Center (PPAC)

Director: Charles Scruggs
Rivera Library, B03 (Lower Level)
(951) 827-6233
ppac@ucr.edu; ppac.ucr.edu

The Pre-Professional Advising Center (PPAC) provides information, advising, and support for students who aspire to graduate/professional programs in health and law professions and wish to enhance their academic and extracurricular preparation. Professional staff and peer mentors are available to guide students as they plan their pre-professional coursework, health and law-related experiences, service work, and research in preparation for applying to programs.

Kessler Scholars Program

Coordinator: Andrea Martinez-Frausto
Student Services Building #2106
(951) 827-1490
ue.ucr.edu/kessler

The Kessler Scholars Program at the University of California, Riverside provides four years of support to students who are the first in their family to attend college. The goal is to help students achieve college success through holistic support services via a cohort-based model. The program is part of the national Kessler Scholars Collaborative along with 15 other institutions. Together, these schools are rethinking how to support first-generation college students as they navigate higher education. Students who join the Kessler Scholars Program are part of a powerful network of first-generation leaders, connected across multiple institutions throughout their undergraduate college experience and beyond.

Reserve Officers' Training Corps (ROTC)

Student Services Building #2106
(951) 827-7389
armyrotc.ucr.edu

UC Riverside Army ROTC is one of six universities in the Claremont McKenna College Golden Lions designed to teach, coach, and mentor cadets on their academic and leadership development journey prior to becoming commissioned officers in the United States Army. ROTC Cadets currently earn academic credit for ROTC courses through a cross-enrollment procedure with California State University, San Bernardino. Students participate in the cross-enrollment process with the permission of their college dean. Academic units earned in ROTC programs are counted as elective units toward UC Riverside graduation requirements.

Strategic Advising

Student Services Building #2106
(951) 827-7750

Undergraduate Education (UE) assembled three-part advising governance structure led by the Advising Governance Committee (AGC). The AGC now serves as the lead advocacy/oversight body for academic advising at UCR working closely with the SAMs and the Advising Council.





GRADUATE STUDIES

Founded as a research institution in 1907, Riverside is the oldest of the UC's southern campuses. UCR combines the intellectual and material resources of the UC system with a uniquely intimate research environment, fostering a type of frequent and high-powered faculty-student contact unavailable at other universities.

Graduate degrees at UCR occupy a distinctive niche in disciplines ranging from chemistry to critical dance studies, computer science to economics. UCR offers graduate and professional programs leading to the degrees of doctor of philosophy, master of arts, master of business administration, master of education, master of finance, master of fine arts, master of professional accountancy, master of public health, master of public policy, and master of science.

Application and Admission

The admission process has as its prime objective the selection of those students most likely to complete their chosen graduate programs with distinction. After consultation between the program and the Graduate Division, the final authority to admit rests with the Vice Provost and Dean of Graduate Studies.

Applicants are initially reviewed and rated based on their undergraduate and, where appropriate, postbaccalaureate GPAs. The minimum requirement for admission to graduate status is the bachelor's degree or its academic equivalent from an accredited institution.

However, the evaluation process is intended to be flexible, and programs take a variety of other factors into consideration when making their admissions recommendations, including GRE or other test scores, GPA in the major subject, letters of recommendation, and the reputation of the degree-granting program or institution.

Soon after the program forwards its recommendation to the Graduate Division, the applicant is notified of the dean's decision. If admission is offered with work still in progress, official transcripts reflecting the satisfactory completion of this work and the awarding of the degree (where appropriate) must be submitted as soon as possible. An offer of admission is valid for a specific quarter only. Accepted students who wish to be admitted for a subsequent quarter may submit a deferment request. If additional course work has been completed, submit updated transcripts.

Applicants should apply at **grad.ucr.edu/apply**.

Campus-wide application deadlines for domestic students are August 1 to June 1 for the fall quarter, November 1 for the winter quarter, and February 1 for the spring quarter. Visit **graduate.ucr.edu/app_deadlines.html** for deadline information.

The deadline for students seeking fellowship awards, teaching or research assistantships, and other merit-based forms of support is January 5.



Graduate Degrees and Programs

Discipline	M.A.	M.S.	M.F.A.	Ph.D.
Art History	•			•
Accounting, Auditing and Assurance	M.P.Ac.			
Anthropology	•	•		•
Astronomy		•		•
Biochemistry and Molecular Biology		•		•
Bioengineering		•[2]		•
Biomedical Sciences		•		•
Biophysics		•		•
Business Administration				•
Business Analytics		•		
Cell, Molecular, and Developmental Biology		•		•
Chemical and Environmental Engineering		•[2]		•
Chemistry		•		•
Classics	•[1]			•
Comparative Literature	•[1]			•
Computational Data Science		•		
Computer Engineering		•[2]		
Computer Science		•[2]		•
Creative Writing and Writing for the Performing Arts			•	
Critical Dance Studies	•[1]			•
Earth and Planetary Sciences		•		•
Economics	•			•
Education	•	M.Ed.		•
Electrical Engineering		•[2]		•
Engineering		•		
English	•[1]			•
Entomology		•[2]		•
Environmental Sciences		•		•
Environmental Toxicology		•		•
Ethnic Studies	•			•
Evolutionary Biology (w/SDSU)				•
Evolution, Ecology, and Organismal Biology		•		•
Experimental Choreography			•	
Finance	M.Fin.			
Genetics, Genomics, and Bioinformatics		•[1]		•
History	•			•
Management	•[1]	M.B.A.		
Materials Science and Engineering		•		•
Mathematics	•	•		•
Mathematics, Applied		•		
Mechanical Engineering		•[2]		•
Medicine				M.D.
Microbiology		•[2]		•
Music	•			•
Neuroscience		•[1]		•
Philosophy	•			•
Physics	•	•		•
Plant Biology		•		•
Plant Pathology		•		•

Graduate Degrees and Programs (Continued)

Discipline	M.A.	M.S.	M.F.A.	Ph.D.
Political Science	•			•
Psychology	•[1]			•
Public Health	M.P.H.			
Public Policy	M.P.P.[2]			
Religious Studies	•			•
Robotics		•		
Sociology	•[1]			•
Southeast Asian Studies	•			
Spanish	•			•
Statistics		•[2]		
Statistics, Applied				•
Visual Art			•	

[1] Applications are not accepted from students wishing to work toward the master's degree only.

[2] A combined 4+1 program is offered in this discipline (designed to lead to a bachelor's degree and master's degree in five years.)

These deadlines may vary somewhat by program, so applicants should not hesitate to contact programs directly for additional information. Please refer to *International Student Admissions* section below for information about international student deadlines.

A nonrefundable application fee must be submitted at the time of application:

Domestic application fee (AB540 and/or DACA status, US citizens, and US permanents residents):

$135 all programs (except Business Analytics, M.B.A, M.Fin., & M.P.Ac.)

$155 Business Analytics, M.B.A., M.Fin., M.P.Ac. & Professional M.B.A.

International application fee (non-immigrant):

$155 all programs (except Business Analytics, M.B.A., M.Fin., & M.P.Ac.)

$180 Business Analytics, M.B.A., M.Fin., M.P.Ac. & Professional M.B.A.

The following must also be submitted:

1. Transcripts from each college or university attended since high school
2. Three letters of recommendation are required by most programs
3. Graduate Record Examination (GRE) general test score is required by some programs

Consult with your program to determine if test scores (GRE, GMAT) are required. When required, test scores should not be older than five years.

Domestic applicants whose first language is not English and who have not earned an undergraduate (bachelor's or first-degree equivalent) or advanced degree (master's or doctorate) at an institution where English is the exclusive language of instruction must provide proof of English proficiency. Please see complete information below under International Student Admission.

International Student Admissions

International students follow the same procedures and are governed by the same regulations as domestic applicants with the following exceptions.

Applicants whose first language is not English and who have not earned an undergraduate (bachelor's or first-degree equivalent) or advanced degree (master's or doctorate) at an institution where English is the exclusive language of instruction must submit scores from the *Test of English as a Foreign Language (TOEFL)*. This exam is administered by the Educational Testing Service and offered in nearly every country abroad. The minimum acceptable scores are: 550 for the written exam; 213 for the computer-based exam, and 80 for the internet-based exam (iBT). Applicants should arrange to take the examination in their home country by visiting **ets.org**.

The TOEFL must be taken no more than two years prior to the intended quarter of enrollment.

Applicants may submit scores from the Academic Module of the *International English Language Testing System (IELTS)*. This exam also must be taken no more than two years prior to the intended quarter of enrollment at UCR. The minimum acceptable score is an overall bandscore of 7 with no score less than 6 on any individual component. Please request an official Test Report Form (TRF) from the test center where the test was taken.

Admitted international students will be required to provide a minimum verification of support (based on program) after accepting an offer of admission. The International Students and Scholars office will be unable to issue a Certificate of Eligibility (I-20 or DS2019) without evidence of the applicant's ability to pay all fees and expenses for the duration of the program of study.

Application deadlines for international students are June 1 (January 5 for admission with fellowship support) for the fall quarter, September 1 for the winter quarter, and December 1 for the spring quarter. These deadlines may vary somewhat by program, so applicants should not hesitate to contact programs directly.

The International Students and Scholars office specializes in providing information and a broad range of services to international students and can be contacted at (951) 827-4113 or visit **international.ucr.edu**.

Returning and Continuing Students

Add a Major: Currently enrolled UCR graduate students can request to add another major with the approval of the new program and their current program. This change is requested via the online application system.

Change of Major: Currently enrolled UCR graduate students can request to change their major with approval of the new program. This change is requested via the online application system.

Change of Degree Objective (PhD to Master's): Currently enrolled UCR graduate students can change their degree objective from PhD to master's within the same major via a petition in R'Grad.

Change of Degree Objective (Master's to PhD): Currently enrolled UCR graduate students can change their degree objective from Master's to PhD within the same major via the online application system.

Readmission: Students who have no student status or are not identified as ready to enroll, will have to reapply to the University to continue in their degree programs. They should follow the same process as new students to apply for readmission. The Graduate Division will retain a students' file for five years. Students applying for readmission within that five year period will not have to provide the University with new transcripts if they have not enrolled elsewhere but will need to provide a new statement of purpose and one letter of recommendation. Students who have been gone over five years must order transcripts from all former institutions attended.

Teaching Credential Programs

Prospective applicants to teaching credential programs should contact the UCR School of Education, **education.ucr.edu** for admission information and application materials or see School of Education later in this catalog.

Minimum Degree Requirements

Campus regulations concerning graduate education are set by the Graduate Council, a committee of the Academic Senate, and carried out by the Graduate Division staff under the direction of the Vice Provost and Dean of Graduate Studies.

Standards of Scholarship

GR 1.2 Standards of Scholarship and Disqualification

Graduate students are expected to prove themselves worthy of the privilege of advanced study and research offered at the university by making acceptable progress towards degree objectives and maintaining the standards of scholarship established by the Graduate Council.

Acceptable Progress includes, but is not limited to:

1. Completing courses with letter grades of "C-" or better or "S". Only these grades and higher may count toward satisfying graduate degree requirements
2. Completing course work and other degree requirements in a timely manner. In order to support timely progress, students may take courses outside of their required course work only with approval of the Graduate Advisor 3. Applying to graduate and completing the academic program once all degree requirements are met

Students are considered to be making unacceptable progress and become subject to dismissal when:

1. Cumulative grade point average falls below the required level of 3.0 at any time or
2. Quarterly GPA in two consecutive terms falls below 3.0, even if the cumulative GPA remains above 3.0 or
3. Fail to make progress in research for two consecutive quarters resulting in NC grades in research units or
4. Program requirements such as exams or research are not fulfilled in a timely or satisfactory manner or
5. Fail to pass critical exams (including comprehensive or qualifying exams) in two attempts or
6. Does not have a faculty advisor to supervise research in accordance with the standard of practice in the student's program or
7. PhD students not advanced to candidacy by their 15th quarter or any student not having completed all degree requirements within one year beyond normative time

After consultation with the appropriate department or graduate group, the Dean of the Graduate Division will notify students who become subject to dismissal of action taken.

Courses must be completed with letter grades of C- or better or S. Only these grades or higher may count toward satisfying graduate degree requirements. To continue in good standing and obtain an advanced degree, students must complete course work and other degree requirements in a timely manner. In order to support timely progress, students may take courses outside of their required course work only with approval of the Graduate Advisor. In addition, students must apply to graduate and complete their academic program once all degree requirements are met. Students are considered to be making unacceptable progress and become subject to dismissal when

- cumulative grade point average falls below the required level of 3.0 at any time or
- quarterly GPA in two consecutive terms falls below 3.0, even if the cumulative GPA remains above 3.0 or
- failing to make progress in research for two consecutive quarters resulting in NC grades in research units or
- program requirements such as exams or research are not fulfilled in a timely or satisfactory manner or
- failing to pass critical exams (including comprehensive or qualifying exams) in two attempts or
- does not have a faculty advisor to supervise research in accordance with the standard of practice in the student's program or

- PhD students not advanced to candidacy by their 15th quarter or any student not having completed all degree requirements within one year beyond normative time

Academic Standing is noted internally in the student profile, not publicly on the transcript or diploma.

Good Standing means the student has at least a 3.0 GPA both cumulative and quarterly.

Academic Warning means the student has received one quarterly GPA of below 3.0, but the cumulative GPA is still above 3.0.

Academic Notice means the student has a cumulative GPA of below 3.0 or two quarterly GPAs of below 3.0.

Master's Degree

The minimum required period of residence in the University is one academic year (3 quarters) of which two quarters must normally be spent at the University of California, Riverside. A candidate for a higher degree is regarded as a student in residence in a regular term only if actually enrolled in at least four units of upper division and/or graduate work; or, in a ten-week summer session at least four units.

The master's degree can generally be earned in one of two ways: by writing a thesis or by passing a comprehensive examination. Some programs offer only one of these options.

Both plans require a minimum of 36 quarter units of graduate (200 level) or upper-division (100 level) undergraduate work in the major subject or some other subject deemed relevant by the program faculty. Many programs have additional requirements. Courses at the 300 and 400 level do not count towards this minimum requirement.

Unless otherwise stated in the program description, the normative time required to complete the master's degree is two years.

Plan I (Thesis) requires that at least 24 units be in graduate (200) level courses taken at a University of California campus (see residency requirements). Of these, only 12 may be in graduate research for the thesis and, in most cases, none may be in courses numbered 291 (exam preparation). Students are guided by a committee of three faculty who must be approved by the Vice Provost and Dean of Graduate Studies. In addition to requiring an acceptable thesis, the department may require any examination that it feels necessary to confirm that the
student has an appropriate knowledge of the discipline. Once completed the thesis must adhere to University standards and be filed in the Graduate Division electronically.

Plan II (Comprehensive Examination) requires that at least 18 units be in graduate (200) level courses taken at a University of California campus (see residency requirements). Of these, only 12 may be in directed research, none may be in graduate research for the thesis and, in most cases, none may be in courses number 291 (exam preparation). Students must take a comprehensive examination, the content of which is determined by the department or program. No more than two attempts to pass the exam are allowed.

Master's students in residence and in good standing may earn course credit by examination. Consult the departmental graduate advisor for further details.

Advancement to Candidacy in Master's Program

Students must file for advancement to candidacy no later than the first week of the quarter in which they expect to receive their degree. Some degree requirements may be in progress at that time. The advancement to candidacy form is available through R'Grad (via R'Web) or directly at rgrad.ucr.edu. Students must complete all requirements for the degree by the last day of the quarter in which they intend to graduate. Students cannot graduate with an Incomplete grade unless they are continuing in a PhD program. Students may not graduate with a GD grade outstanding. Students must be enrolled or on filing fee status to complete degree requirements. If they were enrolled (or on filing fee status) every quarter of the previous academic year then they may complete during the summer without paying fees.

Duplication of Degree

Permission to work for a second master's degree may be approved when there is little relation in content between the two degrees. Duplication of a master's degree in a single field is allowable only with permission of the Vice Provost and Dean of Graduate Studies.

Pursuit of a second doctorate is not permitted for currently enrolled graduate students. It is rarely permitted for students when they first apply to the University. For the Vice Provost and Dean of Graduate Studies to consider such an exception it must be in a fundamentally unrelated area and there will be no duplication or waiving of coursework if approved.

Continuing from the Master's to the Doctorate

Students who are enrolled in a master's program may petition to pursue the doctorate in their field of study. To do so, they should use the graduate application system while they are enrolled. Approval by the department is not automatic; the department determines whether or not each student has the academic potential to succeed in its Ph.D. program. This requirement for evaluating each student's potential and academic fitness to proceed toward the Ph.D. is enforced regardless of the student's initial degree objective at matriculation.

Doctoral Degree

The minimum academic residence for the Ph.D. is six quarters at the University of California, three of which must be spent in continuous residence at UCR. The normative time required for the Ph.D. varies considerably and is given at the end of each program's description in the Programs and Courses section of this catalog. For the doctoral degree, normative time is defined as the period of full-time registration required to earn the degree. For most UCR programs, this is between five and seven years.

The doctorate, the highest degree the university can bestow, is a research degree, conferred on the recommendation of a doctoral committee, which is nominated in consultation with the student by the program faculty and confirmed by the Vice Provost and Dean of Graduate Studies.

Because the Ph.D. is a research degree, the university gives programs considerable latitude in establishing degree requirements. The individual student's program of study is planned in consultation with the graduate advisor, who supervises the student's progress prior to the appointment of the doctoral committee.

A doctoral program generally involves two stages. The first stage is spent fulfilling the requirements established by the program or department and the Graduate Council, typically a series of courses culminating in written and oral qualifying examinations. When these are passed, the student is advanced to candidacy for the Ph.D.

The second, or in-candidacy stage, is devoted primarily to independent study and research and to the preparation of the dissertation. The doctoral dissertation must be an original work of research in the candidate's chosen field of specialization. The doctoral committee determines the acceptability of the dissertation and may require that the student defend its contents in a final oral examination.

Exams

Only two attempts at major exams are allowed unless the program has special approval from the Graduate Council for additional attempts.

Professional Development Requirement

Professional development training is required for all MS, MA, MFA, MPP, and Ph.D. programs. Such training is ideally designed to help students achieve mastery of some core competencies including communication (e.g., writing and publishing, presentation skills, networking); academic development (e.g., skill building in teaching and mentoring, grant writing); leadership and professionalism (e.g., abilities in research/scholarship, professional ethics, and inclusiveness); and career development (e.g., strategies for success in graduate school and the profession, maintaining work/life balance, time management, and career and job market guidance). This list is not meant to be exhaustive or prescriptive, but rather to reflect the range of skills our students need to be successful.

Each program determines the format, content, and extent of its training in order to make it specific to, and appropriate for, the discipline. Training must be for unit credit and may be delivered as a single course or as portions of

multiple courses. The courses must be listed in the catalogue and clearly noted as serving to meet the professional development requirement.

Annual Mentoring and Evaluation

Each academic program has a faculty graduate advisor appointed by the Vice Provost and Dean of Graduate Studies. Advisors assist students in program planning, completing degree requirements, and submit a yearly evaluation of each student's progress toward the degree to the Graduate Division. Students should make an effort to confer regularly with their graduate advisor.

Catalog Year

To be awarded a graduate degree, graduate students may meet graduation requirements in the UCR catalog either: (1) in effect at the time of entrance to UCR, or (2) petition the Vice Provost and Dean of Graduate Studies to use those subsequently established after entrance and prior to the student's graduation.

Special Programs

Appeal of Grades

The Regulations of the Riverside Division of the Academic Senate state that if a student believes that non-academic criteria have been used in determining a grade, the student shall attempt to resolve the grievance with the instructor of the course through written appeal to the instructor via the chair of the department. If the grievance is not resolved to the student's satisfaction at the departmental or college level, the student may file a complaint with the Dean of the Graduate Division. The complaint should be filed immediately after the alleged use of non-academic criteria but no later than six weeks after the beginning of the subsequent quarter. Non-academic criteria are criteria not directly reflective of class performance, such as discrimination on political grounds or for reasons of race, religion, sex, or ethnic origin or for other arbitrary or personal reasons. For additional information on grade appeals please visit https://senate.ucr.edu/regulations/section/558/05

Appeals (Not Grades)

The procedures for appealing adverse outcomes on critical exams (e.g., comprehensive exams, written and oral qualifying exams, final defense), change of major or degree objective, denial of readmission to the same program (if the student was previously in good standing), and other administrative or academic decisions that terminate or otherwise impede progress toward academic or professional degrees can be found at **graduate.ucr.edu/regulations-and-procedures#appeal_procedures**.

Candidate in Philosophy

A Ph.D. student who is advanced to candidacy and has to leave UCR without a degree may apply for the Candidate in Philosophy. This is awarded only to students leaving UCR without a master's or doctoral degree.

Designated Emphases

All graduate students admitted to a Ph.D. program may participate in a Designated Emphasis (D.E.), a specialization that might include a new method of inquiry or an important field of application related to two or more existing Ph.D. programs. The Designated Emphasis is awarded in conjunction with the Ph.D. degree and is signified by a transcript designation. Graduate students who have completed a Designated Emphasis may be more competitive candidates for positions in their primary disciplines. For a complete list of D.E.'s visit **https://graduate.ucr.edu/regulations-and-procedures#designated**

Employee Reduced Fee Program

A student who is a career employee of the University may be eligible for a two-thirds reduction in fees through the Employee Reduced Fee Program. Contact the Benefits Office for more information (**hr.ucr.edu**). Because employees already have health insurance they should contact the Student Health Services about obtaining an exemption from GSHIP. Students that are approved for this fee reduction are not eligible for Half-Time Study and Reduced Fees.

Fees and Financial Support

See Fees and Expenses under the Finances and Registration section of this catalog for a list of estimated expenses and a schedule of mandatory quarterly fees. Deadlines for paying fees are published quarterly at **registrar.ucr.edu**.

Graduate students serving as teaching assistants (TAs) or graduate student researchers (GSRs) who are appointed at 25 percent time (10 hours per week) or more are eligible for payment of the Graduate Student Health Insurance and Partial Fee Remission. Nonresident supplemental tuition is paid for nonresident GSRs who are appointed 45 percent time or more for an academic term, are not receiving any other form of support which pays the nonresident tuition, and who meet the eligibility requirements for the GSR title. Students should check with their departments for further information on these fee remissions.

All students who are considered nonresidents for tuition purposes and are advanced to candidacy for the Ph.D. on or before the first day of instruction will receive a reduction of 100 percent of the nonresident supplemental tuition. Each student is eligible for this reduced nonresident supplemental tuition rate a maximum of three calendar years. Time spent not registered (withdrawn, on leave, or filing fee status) will count toward the three-year total unless the Graduate Dean grants an exception. A student must be advanced by the first day of instruction to qualify for that term.

All graduate students are assessed a quarterly fee for a health insurance policy providing year-round and worldwide coverage (Graduate Student Health Insurance Plan–GSHIP). This insurance is designed to supplement outpatient care available to students through the Student Health Services. This premium is paid for all teaching assistants, graduate student researchers, and readers/tutors employed 25 percent time or more. Students who can demonstrate to the Student Health Services that they have comparable insurance from another source may obtain an exemption from the GSHIP premium. Students awarded the exemption have the GSHIP fee removed from their bill but do not receive any monetary compensation. Deadlines for applying for the exemption are firm.

Information regarding GSHIP benefits, claims, comparable coverage exemptions, and optional dependent coverage can be obtained from the Health Insurance Office, **studenthealth.ucr.edu**. More information about GSHIP remissions for teaching assistants and graduate student researchers is available from the Graduate Division, or a student's academic program.

Students who have not established legal residency in California must pay nonresident supplemental tuition. Regulations governing the determination of California residency are outlined in the Finances and Registration section of this catalog. All students will be assessed this fee until they are declared a resident by the Registrar's Office. Even those who were undergraduates at UCR must complete these forms.

The **Deferred Payment Plan** offers students an opportunity to pay their fees in three monthly installments. An application and fee must be submitted by the deadline set by the Student Business Services office. Students must apply each quarter and may apply through their R'Web accounts.

Fellowships

Fellowships are awarded on the basis of scholarly achievement and promise. Students apply to their prospective programs, which then nominate the most qualified applicants. Recipients must complete a full-time program of study or research each quarter, maintain a GPA of 3.00 or better, have no more than 7 units of "Incomplete" grades, be advanced to candidacy for the Ph.D. within their programs normative time to candidacy, and be making acceptable progress toward their degrees. Fellowships are offered only to full-time students pursuing degrees. Full-time UCR employees, credential and non-degree objective students are not eligible for fellowships. Full-time UCR employees may apply for reduced fees (see above).

Fellowship holders may supplement their awards with employment, with the prior approval of the Graduate Dean. Supplementation levels vary with the type and amount of fellowship award.

GradSuccess

Located in UOB 141, GradSuccess (**graduate.ucr.edu/gradsuccess**) supports graduate student retention, degree completion, and post-degree career outcomes through a diverse range of programs, events, expert consultations, and peer support. We offer the following programs:

- **Graduate Student Resource Center (GSRC)** gsrc.ucr.edu: develops and coordinates various opportunities and events with one goal in mind: to help you succeed both academically and professionally as outstanding, well-rounded, and healthy scholars, From weekly coffee socials and peer support office hours, to quarterly stress-relief fairs and professional development seminars, GSRC is your first stop on the path to building a grad student community and a rewarding post-grad career.
- **Teaching Assistant Development Program (TADP)** tadp.ucr.edu: provides training, support, and pedagogical development for the over 1,000 graduate students employed as teaching assistants. TADP offers orientations, workshops in pedagogical methods, and one-on-one mentoring, as well as recognizing excellence in assistant teaching.
- **University Teaching Certificate Program (UTC)** utc.ucr.edu: is a competitive instructional training and certification program for students planning a career in teaching at the college level. Students completing the two-quarter program develop student-centered teaching and active learning strategies, design a teaching philosophy, and become members of the professional teaching community.
- **Graduate Student Mentorship Network (GSMN)** gradmentors.ucr.edu: offers mentorship best practices to graduate students, postdoctoral researchers, and faculty. Through year-round graduate student programming, the network helps students access support, advice, resources, and a community. Programs focus on professional development, scholarly communication, holistic wellness, and mental health.
- **Graduate Writing Center (GWC)** gwc.ucr.edu: provides writing support and instruction in all academic genre during any stage of the writing process. The GWC offers free workshops and individual writing consultations, as well as summer fellowship preparation programs, dissertation writing support, and specialized disciplinary courses.
- **Graduate Quantitative Methods Program (GradQuant)** gradquant.ucr.edu: offers trainings on a variety of topics, including remedial, introductory, and advanced methods; data management; probability and statistical inference; statistical software and computing; and professional ethics in data management/analysis. GradQuant's highly trained staff also provide individual consultations and drop-in hours.

Loan Programs

Federal Direct Unsubsidized Loans and Federal Direct Graduate Plus Loans are available to graduate students through the Financial Aid Office. Students must complete a *FAFSA* to be considered for these federal loan funds. Students should contact the Financial Aid Office or check **financialaid.ucr.edu** for more information and latest updates.

Research Grants

Dissertation Research Grants provide funds to doctoral candidates for research-related expenses associated with the dissertation. Applicants must be advanced to candidacy and plan to be registered during the period of the award. Proposals may be funded up to a maximum of $2,000. Applications are available at **graduate.ucr.edu/funding#fellowships**.

The Master's Thesis Research Grant is for students enrolled in the Anthropology (M.S. degree only), Art History, Creative Writing and Writing for the Performing Arts, Experimental Choreography, Southeast Asian Studies, and Visual Art for the purposes of expenses directly related to thesis research. Applications are available at **graduate.ucr.edu/funding#fellowships**.

Graduate Student Association (GSA) Conference Travel Grants help to meet the financial needs of students who have been invited to present scholarly papers or posters at regional and national professional conferences. The program, administered by the UCR Graduate Student Association, funds both conference attendees and presenters, with attendees reimbursed at one half the rate of presenters. The percentage of reimbursement is set monthly and is based on the volume of applications received. More information can be found at **https://gsa.ucr.edu/ctg/**.

The Earl C. Anthony Graduate Student Travel Awards are available for PhD students who have advanced to candidacy in the biological, physical, agricultural, engineering, mathematics, and health sciences fields, and in interdisciplinary approaches to these fields, to attend national or international meetings/conferences. Applications are available at **graduate.ucr.edu/funding#fellowships**.

UCR Emeriti Association Graduate Student Travel Award supports graduate students traveling to a national or international professional society conference, symposium, or workshop to present and defend research is a critical part of graduate student education. Travel to access resources available at another institution, museum, private collection, or field site can be essential to the completion of a graduate student's research. Application can be found **https://graduate.ucr.edu/funding#fellowships.**

The UC-HSI DDI President's Pre-Professoriate Fellowship (PPPF) supports three Ph.D. students per UC campus each year who are California HSI alumni and have advanced to candidacy at UC. The fellowship is designed to cultivate interest in academic careers and to prepare students for future roles in the professoriate. In addition to the fellowship, each UC graduate division receives support to offer professional development resources for additional Ph.D. students. These resources are intended to encourage and prepare more students to pursue faculty positions.

The Dissertation Completion Fellowship Award (DCFA) offers financial support to PhD students in the final phase of their degree during the current academic year. DCFA applicants may request funding for up to two quarters. A key component of the application is a clear and detailed timeline that shows you are in the final stages of your program, actively writing your dissertation, and on track to graduate. Both the Dissertation Advisor and Graduate Advisor must verify the student's graduation timeline and confirm their plan to complete the degree within the award period. For more information visit **https://graduate.ucr.edu/funding#fellowships.**

The Dissertation Year Fellowship Award (DYFA) is intended to free PhD students from teaching and other duties, allowing them to fully dedicate their time to completing their dissertation and graduating on schedule. The award provides one full year (three quarters) of financial support for students who plan to finish their PhD in the upcoming academic year. Each graduate program is responsible for submitting its nominees to the Graduate Division. For more information visit **https://graduate.ucr.edu/funding#fellowships.**

Teaching and Research Assistantships

Graduate students may be employed by the university on a part-time basis (not to exceed 50 percent time, or 20 hours per week) during the academic year. Students who hold assistantships must register for and complete a full program of study or research and remain in good standing for the duration of their employment. Students are responsible for reviewing their course enrollment to ensure that they are enrolled in at least 12 units. They may not have more than 7 units of "Incomplete" grades and must be advanced to candidacy within their programs normative time to candidacy after entry to the Ph.D. program. TAs are appointed through their departments and must maintain a GPA of 3.00 or better and be making acceptable progress toward their degree. Any student whose native language is not English must pass an English proficiency exam before performing TA duties. No one may serve in teaching title codes (Teaching Assistant, Teaching Fellow, Associate In_) for more than 18 quarters.

Graduate student researchers, GSRs, are appointed through their departments and can be paid on a full-time basis for up to three months during the summer. To be appointed to and retained as a GSR, students must maintain a GPA of 3.00 or better and be making acceptable progress toward the degree. GSR appointments are made through the department or program.

Registration, Enrollment and Transfer of Credit

Backdating

UCR graduate students may use, with the approval of their Graduate Advisor, any relevant 200-level course(s) taken during a UCR bachelor's program toward a graduate degree at UCR, excluding any 200-level course(s) approved to count for bachelor's degree, unit, or GPA requirements. Alternatively, the Graduate Advisor may approve waiving degree requirements based on 200-level courses taken as a UCR undergraduate and require the student to complete minimum unit requirements while enrolled in a graduate program.

Continuous Registration

Unless a leave of absence has been granted, or on ready to enroll status, students must register for every academic quarter once their graduate studies begin. Students must either be registered or on filing fee status in the quarter in which the degree is awarded. If a student was enrolled or on filing fee status every quarter of the previous academic year, then they may complete their degree during the summer without paying fees.

Education Abroad

Education Abroad provides students with the opportunity to study, intern, or conduct research abroad. To be eligible, students should have completed one year of graduate study, be making acceptable progress toward the degree, and know the language of the host country. Applications and information can be obtained from the Education Abroad office. Additional information about Education Abroad can also be found in the Educational Opportunities sections in the beginning of this catalog.

Enrollment

Each quarter, graduate students must pay their fees, or ensure their fees are paid, and enroll by the date indicated at **registrar.ucr.edu**. Course schedules require the prior approval of the departmental graduate advisor.

All graduate students are expected to carry a full academic course load unless good reasons exist for not doing so. Graduate students are considered to be full time if they are carrying 12 graduate units. Courses for research (e.g. 297, 299) and professional level courses (300 and 400) may only be required for completion of academic degree requirements.

Filing Fee Status

Students who have completed all degree requirements except for filing their dissertations/theses or sitting for their master's comprehensive examinations are eligible for filing fee status during the final quarter of residence. For students writing dissertations or theses, the student's committee must have read and approved a draft of the manuscript, with only minor revisions remaining.

Students on filing fee status pay only one-half of the student services fee. Because filing fee status is tied to that fee, it can vary from quarter to quarter. See **registrar.ucr.edu** for information on fees. Only one quarter on filing fee status is allowed, unless a student fails the master's comprehensive exam. Then a retake of the exam on filing fee status is allowed. Students who fail to complete their degree programs by the appropriate deadline while on filing fees status must register and pay full fees for the following quarter.

Half-Time Study and Reduced Fees

The regulations regarding a reduction in fees for attending half-time is set by the Office of the President. It is only approved for students who cannot attend full-time for reasons of occupation (full-time employment outside the university), unusual family responsibilities, or poor health. Students may not be advanced to candidacy for the PhD and can only enroll in 6 units or less. Employees may not apply for this reduction in fees unless they do not meet the requirements of the Employee Reduced Fee Program. International students should be aware that federal regulations require full-time attendance.

In Absentia Registration

Students pursuing graduate study or research more than 100 miles from the UCR campus for an entire quarter may register in absentia and receive an 85 percent reduction in the student services fee and tuition. Refer to the Finances and Registration section of this catalog for a schedule of fees. *In absentia* registrants are normally advanced to candidacy for the doctorate; master's candidate are normally in the stage of researching the master's thesis.

Incomplete Grades

Most commonly, professors will grant an Incomplete if students were unable to take the final examination or finish a paper at the required time due to illness or other unavoidable problems that can be verified, providing the student's work in the course was of passing quality. In order to remove the "I", students must complete the work required by the end of the next academic quarter (whether in attendance or not)—professors will then report the grade. Incompletes cannot be removed by enrolling in the course during the following quarter. Make arrangements with your instructor on how to replace the "I" for a grade. The "I" will automatically revert to an "F" (or NC) after one quarter. PhD students cannot graduate with an "I" grade on their record. Master's students can only graduate with an "I" if they do not need the course for the degree and are continuing in the PhD program.

Intercampus Exchange

The Intercampus Exchange Program (ICE) allows students to register for up to three courses at another UC campus. To be eligible, students must be in good standing with at least one quarter in residence at UCR and demonstrate at least one of the following: the need to take a course or courses not offered at UCR, the need to study with a particular individual, or the need for continuous access to library holdings or other facilities not available at UCR.

Leave of Absence

A leave of absence is intended to allow the temporary interruption of the student's academic program. Leaves are granted for the following reasons:

1. Serious illness or other temporary disability
2. The need to concentrate on a job or occupation not directly related to the degree program
3. Family responsibilities

To be eligible for a leave of absence, students must have the approval of their graduate advisor, be in good standing, and have been enrolled for at least one quarter. Leaves are not normally granted for more than one year.

Since students on leave do not pay fees, they may not use university facilities or make demands on faculty time. Students on leave are ineligible for fellowships, research grants, and financial aid. Appointment as a graduate student researcher or teaching assistant, or any other appointment requiring full-time enrollment, is not possible. Nor can students on leave take qualifying examinations or receive credit for academic work done during the leave period.

Ready to Enroll Status

If a student has been an enrolled student for at least one quarter and does not enroll in a subsequent quarter, they can re-enroll for up to two consecutive quarters without having to reapply for admission.

Repeating Courses

A graduate student may repeat only those courses in which a grade of D, F or NC was received. Repetition of a course more than once requires approval of the Vice Provost and Dean of Graduate Studies. Only the most recently earned grade is used in computing the student's grade point average. Courses in which a grade of D or F has been earned may not be repeated on an S/NC basis.

Satisfactory/No Credit (S/NC) Grading

Graduate students may take course work on an S/NC basis only when the course description indicates it is an option. Graduate students may not use undergraduate or graduate courses taken on an S/NC basis to

complete their master's or PhD degree requirements, unless the course only is offered on an S/NC basis. A grade of S is equivalent to a grade of B (3.0) or better but does not count towards the student's grade point average. No credit is given for a course in which a grade of NC is assigned.

Substituting and Waiving Course Work

All substitutions or waivers of degree requirements syst be reviewed by the Graduate Adviser and approved by the Vice Provost and Dean of Graduate Studies, prior to the beginning of the quarter. Waiver of course work will not reduce the minimum number of units required for a master's degree.

Transfer of Credit

A maximum of 8 quarter units from institutions outside the University of California may be counted towards the master's degree at UCR. All transfer work must have been completed in graduate standing with a minimum grade of "B." Units cannot be transferred if the student earned a degree. These units may not be used to reduce the minimum number of graduate level units required (24 units required for the thesis plan and 18 units required for the comprehensive exam plan).

Department and Graduate Division approval must be obtained before these units can be accepted for credit. Units are transferred as "Satisfactory" (S) with no grade point value.

Since doctoral students do not have a strict unit requirement they do not need to transfer in units.

Students may apply summer sessions course work from any UC campus toward their graduate degree requirements if they have the prior approval of their departments and of the Vice Provost and Dean of Graduate Studies.

Units from another UC campus may be used to satisfy one of the three quarters of the residence requirement and may be counted for up to one-half of the total units required for the UCR master's degree. Department and Graduate Division approval must be obtained before such units can be accepted for credit. Units cannot be transferred if the student has earned a degree from that campus.

In addition, students may transfer up to 8 units of concurrent enrollment credit. Concurrent enrollment means that a student took regularly scheduled UCR classes but was not an admitted student and paid fog- the class through UCR Extension. Students must have taken these units berore their enrollment as graduate students. Matriculated graduate students (including students on leave of absence) may not enroll in course work through Extension without the Graduate Dean's approval. Graduate students who withdraw before completing their program objectives, then take courses through Extension are required to wait one year before applying courses to their degrees. Grades from UCR Extension courses wiabe recorded on student transcripts.

Withdrawal

Students who withdraw during the first five weeks of a quarter are entitled to a partial refund of fees. The amount of the refund is determined by the number of calendar days elapsed between the first day of instruction and the date on which a withdrawal form is filed with the Graduate Division. See the Schedule of Refunds in the Finances and Registration section of this catalog. Students who have applied for the Deferred Payment Plan are considered registered students and are held to the same refund schedule.

Students who are unable to file the necessary paperwork due to illness or emergency should contact their academic program immediately.

Students may apply summer sessions course work from any UC campus toward their graduate degree requirements if they have the prior approval of their departments and of the Graduate Dean.

Units from another UC campus may be used to satisfy one of the three quarters of the residence requirement and may be counted for up to one-half of the total units required for the UCR master's degree. Department and Graduate Division approval must be obtained before such units can be accepted for credit. Units cannot be transferred if the student has earned a degree from that campus.

In addition, students may transfer up to 8 units of concurrent enrollment credit. Concurrent enrollment means that a student took regularly scheduled UCR classes but was not an admitted student and paid for the class through UCR Extension. Students must have taken these units **before** their enrollment as graduate students. Matriculated graduate students (including students on leave of absence) may not enroll in course work through Extension without the Graduate Dean's approval. Graduate students who withdraw before completing their program objectives, then take courses through Extension are required to wait one year before applying courses to their degrees. Grades from UCR Extension courses **will** be recorded on student transcripts.

Backdating

UCR graduate students may use, with the approval of their Graduate Advisor, any relevant 200-level course(s) taken during a UCR bachelor's program toward a graduate degree at UCR, excluding any 200-level course(s) approved to count for bachelor's degree, unit, or GPA requirements. Alternatively, the Graduate Advisor may approve waiving degree requirements based on 200-level courses taken as a UCR undergraduate and require the student to complete minimum unit requirements while enrolled in a graduate program.

Substituting and Waiving Course Work

All substitutions or waivers of degree requirements must be reviewed by the Graduate Adviser and approved by the Graduate Dean, prior to the beginning of the quarter. Waiver of course work will not reduce the minimum number of units required for a master's degree.



COLLEGE AND ACADEMIC PROGRAMS

College of Humanities, Arts, and Social Sciences

Student Academic Affairs
3400 Humanities and Social Sciences
University of California, Riverside
Riverside, CA 92521
(951) 827-3683; fax (951) 827-5836
chass.ucr.edu

The degree programs in the College of Humanities, Arts, and Social Sciences are designed to introduce students to both the breadth and depth of the university's curriculum. This is accomplished by combining a wide distribution of courses with the opportunity to concentrate on course work in depth in a selected field. To achieve the first goal, students are required to take a wide range of lower-division courses that explore the diversity of human knowledge. In the upper-division curriculum, students are relatively free to concentrate in depth in their major field of interest.

Majors

A major is a coordinated group of upper-division courses (courses numbered 100-199) in a field of specialization. The major may be a program of upper-division courses within a single department (departmental major) or a group of related courses involving a number of departments (interdisciplinary major).

Before enrolling in certain upper-division courses, students may be required to gain appropriate knowledge by completing specific prerequisite courses. With the assistance of a departmental advisor, students are expected to select lower-division courses that prepare them for the advanced studies they propose to follow.

Choosing a Major, Undeclared Majors

While freshmen may choose an academic major on entering UCR, those who are unsure about specific academic goals may request to be admitted to the college as undeclared. These students often take introductory courses in the natural sciences, social sciences, humanities, and fine arts while searching for an area that most excites their interest. Undeclared majors are encouraged to meet with an advisor in the Student Academic Affairs Office about their selection of courses.

Students with 90 or more units toward a degree must declare a major. To declare a major, students must obtain approval from the department offering the major. Students who do not declare a major by 90 or more units may have a hold placed on their registration.

If undeclared majors feel that their interests lie in the areas of the natural and agricultural sciences, mathematics and statistics, or engineering and computer science, the College of Humanities, Arts, and Social Sciences (CHASS) Transition Advisor should be consulted. Contact information for the CHASS Transition Advisor, as well as information on the CHASS Transition Policy, can be found on the CHASS Student Affairs website.

Double Majors

Students can declare a second major within the College of Humanities, Arts, and Social Sciences or a second major in a department or program of another college. Changes of major are not permitted while on academic notice or during the final senior year (135 units or more). Both majors must be completed within the maximum limit of 216 units, and approval must be obtained from advisors in both departments or programs. In such cases, all course requirements must be completed for each of the two majors chosen. One of the two majors must be designated as the primary major for the purpose of satisfying breadth or general education requirements. No more than 8 upper-division units may count for both majors simultaneously.

A declaration of two majors in different colleges must be approved by the colleges concerned and filed by the student with the college of the principal major. If the two majors lead to different degrees (B.S. and B.A.), that fact will be noted on the transcript, but only one diploma indicating both degree designations will be issued upon successful completion of such a program. Furthermore, if the double major is a mixed B.S./B.A., the college requirements for both majors must be met.

Students wishing to declare a second major must present an outline to the Student Academic Affairs Office, indicating which major will be used to satisfy breadth requirements and any overlap courses between the two majors.



College of Humanities, Arts, and Social Sciences
Undergraduate Majors and Options

Administrative Studies[1] (major with Art History, B.A.; Economics, B.A.; History, B.A.; Political Science, B.A.; Religious Studies, B.A.; and Sociology, B.A., B.S.)	B.A.	
African American Studies	B.A.	
Anthropology (also major with Law and Society, B.A.)	B.A.	B.S.
Art (Studio)	B.A.	
Art History (also major with Administrative Studies, B.A.; and Religious Studies, B.A.)	B.A.	
Asian American Studies	B.A.	
Asian Studies	B.A.	
Black Study[2]	B.A.	
Business Economics	B.A.	
Chicano Studies	B.A.	
Creative Writing	B.A.	
Dance	B.A.	
Economics (also majors with Administrative Studies, B.A.; and Law and Society, B.A.)	B.A.	
English	B.A.	
Environmental Studies	B.A.	
Ethnic Studies	B.A.	
Gender and Sexuality Studies	B.A.	
Global and Community Health	B.A.	
Global Studies	B.A.	
History (also majors with Administrative Studies, B.A., and Law and Society, B.A.)	B.A.	
Humanities, Arts, and Social Sciences Interdisciplinary	B.A.	
Languages and Literatures/Chinese	B.A.	
Languages and Literatures/Classical Studies	B.A.	
Languages and Literatures/Comparative Ancient Civilizations	B.A.	
Languages and Literatures/Comparative Literature	B.A.	
Languages and Literatures/French	B.A.	
Languages and Literatures/Germanic Studies	B.A.	
Languages and Literatures/Japanese	B.A.	
Languages and Literatures/Languages	B.A.	
Languages and Literatures/Russian Studies	B.A.	
Latin American Studies	B.A.	
Law and Society[1] (major with Anthropology, B.A.; Economics, B.A.; History, B.A.; Philosophy, B.A.; Political Science, B.A.; Psychology, B.A.; and Sociology, B.A., B.S.)	B.A.	
Liberal Studies	B.A.	
Linguistics	B.A.	
Middle East and Islamic Studies	B.A.	
Media and Cultural Studies	B.A.	
Music	B.A.	
Music and Culture	B.A.	
Native American Studies	B.A.	
Neuroscience	B.A.	B.S.
Philosophy (also major with Law and Society, B.A.)	B.A.	
Political Science (also majors with Administrative Studies, B.A.; International Affairs, B.A.; Law and Society, B.A.; and Public Service, B.A.)	B.A.	
Psychology (also major with Law and Society, B.A.)	B.A.	B.S.
Religious Studies (also majors with Administrative Studies, B.A., and Art History, B.A.)	B.A.	
Sociology (also majors with Administrative Studies, B.A., B.S.; and Law and Society, B.A., B.S.)	B.A.	B.S.
Southeast Asian Studies	B.A.	
Spanish	B.A.	
Sustainability Studies[2]		B.S.
Theatre, Film and Digital Production	B.A.	

[1] Only offered as a major combined with other programs.
[2] New student registration in this program is not open at present.

Disciplinary Minors

African American Studies[3]
Anthropology
Art History
Asian American Studies[3]
Black Study[2]
Chicano Studies[3]
Creative Writing
Dance
Economics
English
Ethnic Studies
Feminist Studies
History
Languages and Literatures/
Arabic
Chinese
Classical Studies
French
Germanic Studies
Italian Studies
Japanese
Korean
Russian Studies
Southeast Asian
Music
Native American Studies[3]
Neuroscience
Philosophy
Political Science
Psychology
Sociology
Religious Studies
Spanish
Theatre, Film and Digital Production

Interdisciplinary Minors

Asian Studies
Chicano Bilingual-Bicultural Studies
Environmental Studies
Global and Community Health
Global Studies
International Relations
Journalism
Labor Studies
Latin American Studies
Law and Society
Queer Studies
Marxist Studies
Media and Cultural Studies
Medical and Health Humanities Studies
Middle East and Islamic Studies
Peace and Conflict Studies
Speculative Fiction and Cultures of Science
Southeast Asian Studies
Urban Studies
Western American Studies

The disciplinary and interdisciplinary minor requirements of Asian Studies and Latin American Studies are described in the Programs and Courses section under the appropriate department or program. For a description of the other interdisciplinary minors, see individual listings in the Programs and Courses section.

[3] See Ethnic Studies for descriptions of these minors.

Interdisciplinary Majors

Liberal Studies Major

Students planning to become elementary school teachers should consider declaring the Liberal Studies Major. The lower-division core of courses prepares students with subject matter preparation in the required subjects of the California Department of Education K-6 Frameworks. The upper-division requirements allow students to build upon their strengths and interests and at the same time provide them with a connection to the core Education courses.

This major achieves the goal of a rigorous major while providing prospective teachers with the broad undergraduate education required for elementary school teaching. See information on these programs in the Programs and Courses section of this catalog. Several of the college's regular major programs have an interdisciplinary emphasis that allows examination of a particular problem, theme, or area from a variety of perspectives.



Internships, Independent Projects and Student Research

The Humanities, Arts, and Social Sciences student can often practice the subject, as well as read about it. Many undergraduates have the opportunity to work with a faculty member on a research project, and many departments offer field work and internship courses. In these courses, students combine several hours per week of experience in an agency or firm with study of related academic materials and participation in a seminar, where formal knowledge and practical experience are related to one another. Internship experiences are regularly available in settings such as public and business administration, politics, environmental protection, social welfare, criminal justice, clinical and other psychology programs, museums and archival installations, newspapers, and art galleries.

Normally, each local internship does not count for more than 4 or 5 units in a single term, larger numbers of units being reserved for quarter-away internships. Petitions for credit beyond 5 units in a single quarter for a local internship must have the sponsoring agency's approval and a written justification by the student's faculty sponsor. All such requests require the associate dean's approval.

A maximum of 16 units of credit toward the bachelor's degree may be obtained through internship courses, with a maximum of 12 units of internship scheduled in a single quarter for quarter-away situations. Students who are on academic notice may not enroll in internship courses.

Transfer of Majors, Changing Majors

College of Humanities, Arts and Social Sciences. Admission is selective based on GPA in all transferrable coursework with a minimum GPA of 2.4. Neuroscience and Psychology applicants must have a minimum GPA of 2.7 in all transferable college coursework. Psychology applicants must also have a minimum of one UC transferable mathematics course equivalent to Math 004 or higher.

Minors

The College of Humanities, Arts, and Social Sciences offers minor programs; however, no student is required to take a minor. Minors are not degree-granting majors; they are sequences of supplemental courses designed to enhance work in certain areas. Any minor may be taken jointly with any departmental or interdepartmental major. Minors in the college shall consist of not fewer than 16 nor more than 28 units of organized upper-division course work. No overlap may occur among courses used to satisfy upper-division course requirements for a major and a minor. A GPA of at least 2.00 is required in upper-division courses in the field of the minor.

A minor is a set of courses focused on a single discipline or an interdisciplinary thematic area. There can be no substitution for the courses listed as constituting a minor without approval of the governing department or committee. There is no limit on the number of minors a student can declare. Students must declare the minor(s) before their final degree check before graduation by completing a petition with their Academic Advisor in the College of Humanities, Arts, and Social Sciences, the Student Affairs Office in the College of Natural and Agricultural Sciences, or the Bourns College of Engineering, depending on their major. Prior approval by the department or committee offering the minor is required. The minor is noted on the transcript at the time the degree is conferred.

University Honors Program

For a description of the University Honors Program, see Educational Opportunities in the front of this catalog. For a listing of requirements and courses, refer to University Honors Program in the Programs and Courses section.

Undergraduate Pre-Business Program

Pre-Business is a two-year program that prepares students to apply to the Business Administration major. Students who elect Pre-Business are advised in the College of Humanities, Arts, and Social Sciences during their first-year and sophomore years. Students who elect Pre-Business must gain admission to Business Administration by the time they have earned approximately 90 units.

Degree Requirements

Students in the College of Humanities, Arts, and Social Sciences must meet three levels of requirements for the Bachelor of Arts or Bachelor of Science degree: general university requirements, college requirements, and major requirements.

General University Requirements

General university requirements are listed at the beginning of the Undergraduate Studies section. In addition, the College of Humanities, Arts, and Social Sciences has the following requirements and limitations.

Unit Requirements

Students must satisfactorily complete for credit a minimum of 180 units for the bachelor's degree. A maximum of 216 units is allowed. After having credit for 216 units, students are not permitted to continue except in cases approved by the associate dean in which specific academic or professional reasons are involved.

Credit Limitations

Transfer students with credit from other institutions (advanced standing credit), receive a transfer profile from the Office of Undergraduate Admissions. The Transfer Credit and Articulation Services (TCAS) office will articulate and reduce units to 105 lower division transfer units (not including UC courses). However, credit limitations may reduce the total number of units which apply toward the degree in the College of Humanities, Arts, and Social Sciences. Students should meet with an academic advisor in their major for questions regarding transfer credits.

The following credit limitations apply for all students enrolled in the college:

1. No more than 70 semester/105 quarter UC transferable lower-division units completed at another institution or any combination of institutions will be allowed. Units earned at any UC campus are not included in this limitation.
2. No more than 6 units in physical education activity courses may be applied toward the 180-unit requirement for the bachelor's degree.
3. No 400 series courses and not more than three courses in the 300 series of courses may be counted toward the 180 unit requirement for the bachelor's degree.
4. No more than 5 units of credit may be taken per quarter in special studies courses. See specific restrictions under each departmental listing regarding credit toward the major in special studies courses.



College of Humanities, Arts, and Social Sciences

Breadth Requirement Unit Summary

For the B.A.	
English Composition	Varies
Humanities	20
Social Sciences	16
Ethnicity (4 units)[1]	—
Foreign Language (level 4)	16
Natural Sciences and Mathematics	20
Total Units	**72 plus English Composition**

For the B.S.	
English Composition	Varies
Humanities	20
Social Sciences	16
Ethnicity (4 units)[1]	—
Foreign Language (level 3)	12
Natural Sciences and Mathematics	20
Total Units	**68 plus English Composition**

[1] The 4-unit ethnicity requirement can be applied to either the Humanities or Social Sciences requirement, depending on content.

College Breadth Requirements

The Student Academic Affairs Office, in consultation with the Executive Committee of the College of Humanities, Arts, and Social Sciences, determines which courses apply to the following requirements. It is the student's responsibility to verify those courses that fulfill these subject requirements. To search for courses that meet specific breadth requirements, visit classes.ucr.edu.

Courses taken in the department or program of a student's major (including courses cross-listed with the major) may not be applied toward the breadth requirements except for History majors in connection with the World History requirement, English majors in connection with the English Composition requirement, Ethnic Studies majors in connection with the Ethnicity requirement, and foreign language majors in connection with the Foreign Language requirement. However, courses outside the major discipline, but required for the major, may be applied toward satisfaction of these requirements.

Students who elect a double major may apply courses in one of the majors toward satisfaction of the breadth requirements.

For the following requirements, a course is defined as a block of instruction which carries credit of 4 or more units.

No course may be applied to more than one breadth requirement, with the exception of the course taken to meet the Ethnicity requirement and a Writing Across the Curriculum course. Internship and independent studies courses may not be used to satisfy breadth requirements.

Courses offered by or cross-listed with Business Administration, Education, and Physical Education may not be used to satisfy breadth requirements.

English Composition

Students must demonstrate adequate proficiency in English Composition by completing a one-year sequence of college level instruction in English Composition with no grade lower than "C." Courses in the Writing Across the Curriculum (WAC) program and other alternatives approved by the Academic Senate designates as alternatives to WRIT 030 or WRIT 030S may be applied toward satisfaction of the third quarter of the writing requirement if students earn a "C" or higher.

Students should enroll in an English composition course each quarter they are registered at UCR until the sequence of preliminary Entry Level Writing courses, if needed, and WRIT 010 or WRIT 010S, WRIT 020 or WRIT 020S, WRIT 030 or WRIT 030S (or an alternative designated by the Academic Senate) is completed with the satisfactory GPA.

Transfer students who have credit for one semester of English Composition from another institution are required to take two additional quarters, i.e., WRIT 020 or WRIT 020S and WRIT 030 or WRIT 030S.

Students have the option of using a score of 3 on the College Board Advanced Placement Test in English to satisfy WRIT 010 or WRIT 010S; they must complete WRIT 020 or WRIT 020S and WRIT 030 or WRIT 030S.

Students with a score of 4 or 5 on the College Board of Advanced Placement Test in English have satisfied WRIT 010 or WRIT 010S and WRIT 020 or WRIT 020S; they must complete WRIT 030 or WRIT 030S or equivalent.

Humanities: 20 units

For the B.A. degree

1. One course in World History (At UCR, courses that satisfy this requirement are HIST 010 or HIST 015 or HIST 020.)
2. One course in the Fine Arts (Art, Art History, Dance, Media and Cultural Studies, Music, Theatre, Film and Digital Production, or Creative Writing courses in poetry, fiction, or playwriting)
3. Two courses from among the following:
   a) Literature (offered by the departments of English, Comparative Literature and Foreign Languages, Hispanic Studies)
   b) Philosophy
   c) Religious Studies
4. One additional course from the following:
   a) History, the Fine Arts, Literature, Philosophy, Religious Studies
   b) A foreign language at level 3 or higher (Courses used in fulfillment of the foreign language requirement may not be used to meet this requirement.)
   c) A humanities course offered by Ethnic Studies; Creative Writing (courses in journalism); Humanities, Arts, and Social Sciences Interdisciplinary; Latin American Studies; Linguistics; or Gender and Sexuality Studies

For the B.S. degree

1. One course in World History (At UCR, courses that satisfy this requirement are HIST 010, HIST 015, or HIST 020.)
2. One course from the following:
   a) Fine arts (Art, Art History, Dance, Media and Cultural Studies, Music, Theatre, Film and Digital Production, Creative Writing courses in poetry, fiction, or playwriting)
   b) Literature (taken in the departments of English, Comparative Literature and Foreign Languages, Hispanic Studies, or Media and Cultural Studies)
   c) Philosophy
   d) Religious Studies
3. Three additional courses from the following:
   a) History, the Fine Arts, Literature, Philosophy, Religious Studies
   b) A foreign language at level 3 or above (Courses used in fulfillment of the foreign language requirement may not be used to meet this requirement.)
   c) Humanities courses offered by Comparative Ancient Civilizations; Creative Writing (courses in journalism); Ethnic Studies; Gender and Sexuality Studies; Global Studies; Humanities, Arts, and Social Sciences Interdisciplinary; Latin American Studies; Linguistics; or Media and Cultural Studies

Social Sciences: 16 units

1. One course in Economics or Political Science
2. One course in Anthropology, Psychology, or Sociology
3. Two additional social science-related courses from Comparative Ancient Civilizations, Environmental Sciences; Ethnic Studies; Gender and Sexuality Studies; Geography (cultural geography courses); Global Studies; Human Development; Humanities, Arts, and Social Sciences Interdisciplinary; Media and Cultural Studies; Public Policy; or one of the disciplines in 1. or 2. above

Ethnicity: 4 units

One course focusing on the general concepts and issues in the study of race and ethnicity in California and the United States. Courses that satisfy this requirement must concentrate on one or more of four principal minority groups (African American, Asian American, Chicano/Latino, and Native American). These courses must be comparative in nature, analyzing the minority group experience within the present and historical context of other racial and ethnic groups, such as European-American minorities. The courses are to be offered by or cross-listed with the Department of Ethnic Studies.

Refer to the Programs and Courses section for the courses that fulfill the Ethnicity requirement.

Foreign Language

Courses in American Sign Language may be used to meet this requirement.

For the B.A. degree: course level 4 or equivalent

This requirement may be satisfied by students (except for foreign language majors who satisfy the spirit of the language requirement by majoring in one or more languages) by completing the fourth-quarter level or its equivalent in one language at UCR (or at another college or university) with a minimum grade of "C" or by demonstrating proficiency at the fourth-quarter level on a foreign language placement exam offered by one of the foreign language departments at UCR. This test does not yield unit credit; it only determines whether the Foreign Language requirement has been met, or in which course of the language sequence a student should enroll. The placement exam may be taken only once in each subject during a student's UCR career. Students continuing with the same foreign language they completed in high school must take a placement exam (visit placementtest.ucr.edu for dates and locations). Credit will be allowed only at the course level for which they qualify according to the placement exam.

For the B.S. degree: course level 3 or equivalent

This requirement may be satisfied by students (except for foreign language majors who satisfy the spirit of the language requirement by majoring in one or more languages) by completing the third-quarter level or its equivalent in one language at UCR (or at another college or university) with a minimum grade of "C" or by demonstrating proficiency at the third-quarter level on a foreign language placement exam offered by one of the foreign language departments at UCR. This test does not yield unit credit; it only determines whether the Foreign Language requirement has been met, or in which course of the language sequence a student should enroll. The placement exam may be taken only once in each subject during a student's UCR career. Students continuing with the same foreign language they completed in high school must take a placement exam (visit placementtest.ucr.edu for dates and locations). Credit will be allowed only at the course level for which they qualify according to the placement exam.

Natural Sciences and Mathematics: 20 units

1. One course in Mathematics, Statistics, or Computer Science
2. One course in Biological Sciences (Biochemistry, Biology, Botany and Plant Sciences, Entomology, Nematology, or Plant Pathology)
3. One course in Physical Sciences (Chemistry, Physics, Earth Sciences, excluding cultural Geography courses)
4. Two additional courses from the areas listed above or in physical and/or biological science courses offered in the Department of Environmental Sciences

Major Requirements

Detailed requirements for each major can be found under the department or program listing in the Programs and Courses section of this catalog.

A major in the College of Humanities, Arts, and Social Sciences shall consist of not fewer than 36 upper-division units. All courses applied toward the major and preparation for the major must be taken for a letter grade unless otherwise approved by the department chair. A 2.00 GPA in upper-division courses in the major is required for graduation. Once enrolled on this campus, students must complete all courses designated for a major in regular or summer sessions at UCR; exceptions to this policy must be approved by the department chair and by the associate dean.

Candidates for the B.A. degree may not receive more than 80 units of credit toward the degree for work taken in the major discipline (i.e., students must take at least 100 units outside the major discipline). Music and Dance majors may count a maximum of 102 units of music course work toward the B.A. degree (i.e., students must take at least 78 units outside the Music or Dance major).

Candidates for the B.S. degree may not receive more than 108 units of credit toward the degree for work taken in the major discipline (i.e., students must take at least 72 units outside the major discipline).

To receive the bachelor's degree, transfer students must complete a minimum of 16 upper-division units in the major on the Riverside campus.

Students who have been away from the university for several terms should consult with their major departmental advisor about the requirements under which they may graduate. See the Catalog Rights Policy for Undergraduate Degrees in the Policies and Regulations section of this catalog.

College Policies and Procedures

For more information on UCR policies and regulations see the Policies and Regulations section of this catalog.

College Regulations

Refer to the Student Academic Affairs Web site at chassstudentaffairs.ucr.edu for more information on college policies and procedures.

Student Responsibility

Students are responsible for meeting deadline dates regarding enrollment, add/drop/withdrawal, change of grading basis, credit by examination, declaration of candidacy, and other actions. The dates are online at registrar.ucr.edu and must be observed. Advising can be obtained in the student's major department or in the college's Student Academic Affairs Office, 3400 Humanities and Social Sciences Building.

Academic Advising

It is the student's responsibility to meet all graduation requirements: general university, college, and major.

Students with declared majors receive academic advising through their major department. Major advisors are available within each department or program (see a list of departmental staff for academic affairs at chassstudentaffairs.ucr.edu). All departments assign an academic advisor to each major and may require an advisor's approval before enrolling, submitting an academic petition, or making a change in the class schedule. Entering students who have not yet selected a major field of study should contact the Student Academic Affairs Office.

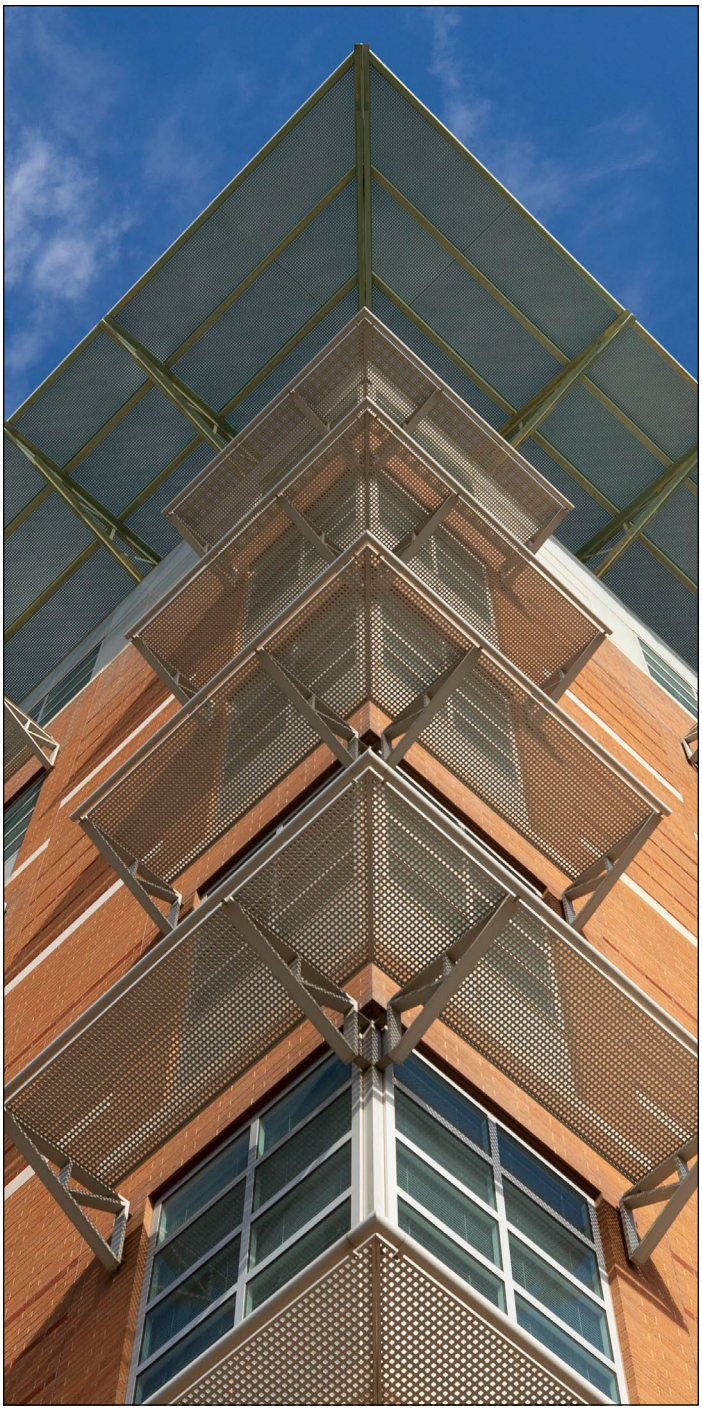
Undeclared and Pre-Business students are advised through the Student Academic Affairs Office. A staff of academic advisors is readily available to assist with questions pertaining to academic regulations and procedures, selection of courses which satisfy breadth requirements, major options, and alternatives. Students who need to confer with an advisor about overall degree requirements, academic difficulty, program planning, or assistance in selecting a major need to schedule an appointment with their advisor.

Course Enrollment

Students are required to register and enroll by the date set by the campus (visit registrar.ucr.edu for details).

The recommended study load for undergraduate students is 15 to 16 units per quarter. This is the average quarterly load to ensure steady progress for graduation in four years. The minimal program for an undergraduate student to be considered full time is three courses (12 units) per quarter. The normal progress for an undergraduate student is four courses (16 units) per quarter.

A class schedule of fewer than 12 units must be approved by the associate dean (visit registrar.ucr.edu for details on a part-time fee waiver for enrollment in 10 or less units). The college has established enrollment limits beyond which students require academic advisor approval. The limits are as follows: students in good academic standing, 20 units; students on academic notice, 17 units; students on subject-to-dismissal status, 15 units. Students on academic notice may not take courses on an "S/NC" basis.



After the second week of instruction, students may request changes by petition during a specified period. Petitions must usually be approved by the advisor and also, in the case of adds, by the instructor concerned. Changes to grading basis need advisor approval after the second week of classes. The associate dean must approve any changes in the class schedule requested after the regular petition period.

Courses (including Special Studies courses) can be added through the third week of instruction. Courses dropped after the second week of instruction will appear on the record with a "W" notation, signifying withdrawal. Students can withdraw from courses through the sixth week of instruction. The grading basis for a course can be changed through the eighth week of instruction. After the third week of instruction, a fee is required to file the petition to change the class schedule. Please verify dates and deadlines via the Academic Calendar at registrar.ucr.edu/calendar.

Enrollment on Satisfactory/No Credit Basis

Undergraduate students in good academic standing may receive credit for courses undertaken and graded "S" up to a limit of one-third of the total units undertaken and passed on the Riverside campus at the time the degree is awarded. Normally, this means no more than 4 units of "S/NC" per quarter. The total also includes courses graded only "S/NC." Courses that are required in, or prerequisite to, a major may not be taken on a "S/NC" basis unless approved by the chair of the major department. Students on special status or limited status may take courses on a "S/NC" basis only with the approval of the associate dean.

A student may elect "S/NC" or delete "S/NC" from a course by filing a petition (enrollment adjustment form) with the Registrar. The deadline is the end of the eighth week of instruction and is listed each quarter at registrar.ucr.edu. This deadline is strictly enforced.

Regulations governing the "S/NC" option are described under Credit and Grades in the Policies and Regulations section of this catalog.

Repetition of Courses

See Repetition of Courses in the Policies and Regulations section.

Part-time Study

For details, see Part-Time Study under the Finances and Registration.

Petitions

A petition is a form representing a student's need or desire to be excepted from any standard rule or regulation in the university. It is the only way to obtain formal approval from the department, the college or school, the Registrar, or whomever has authority over a particular request. Some petitions carry a small fee; others are free.

An approved petition for a waiver or substitution in degree requirements represents an agreement between the student, the college or school, and in some cases, the department chair, granting the student an exception from the existing regulations.

Petitions are also used at UCR to change college or major, enroll in fewer units than regulations permit, make late changes to a class schedule, obtain credit by examination, gain approval for concurrent enrollment, or withdraw from the university. Petitions for most of these exceptions are available in the Student Academic Affairs Office. Please note that petitions for retroactive actions more than one year old will not be approved.

Credit by Examination

To earn credit for a course by examination without formal enrollment in that course, students must be in residence and in good academic standing.

Before the examination may be given, arrangements and approval for examination for degree credit must be made with the instructor appointed to give the examination, a faculty advisor (if the major department requires it), and the associate dean. Petitions must be filed with the Office of the Registrar no later than the third week of instruction. Credit by examination is not allowed for English Composition courses.

The results of all examinations for degree credit are entered on students' records as though they had actually taken the courses of instruction. The credit by examination procedure may not be used as a means of improving a previous grade.

Undergraduate Credit for Graduate Courses

Students who have a GPA of at least 3.00 in all courses taken in the university or have shown exceptional ability in a special field may take a graduate course for undergraduate credit with the permission of the instructor concerned. Students must have completed at least 18 upper-division quarter units basic to the subject matter of the course.

Expected Progress for Undergraduate Students

At the close of each quarter, the courses, units, grades, and grade points earned are added to the student's cumulative university record. This record summarizes progress toward a degree. Lack of adequate progress may jeopardize continued registration. Students can access their advisory degree check through rweb.ucr.edu.

Applying for Graduation

Submit your application via R'Web by the appropriate deadline. The application process is a two-step process with an initial submission via R'Web and a secondary submission through the College of Humanities, Arts and Social Sciences Application for Graduation. Instructions are provided at the end of your R'Web application.

Students should review their remaining requirements through rweb.ucr.edu each quarter. They should also contact their academic advisor in their major department or program at least two quarters before expected graduation to confirm remaining requirements. Completion of the degree depends upon completion of any work in progress. During the graduation quarter, any changes made to a student's schedule after instruction begins should be immediately reported to the academic advisor.

If for any reason a student does not meet the requirements for graduation after filing the application, another application must be filed for the appropriate quarter. Inactive students graduating in absentia who need to change their major, minor, concentration, or catalog year, should contact their Academic Advisor before they apply to graduate. Inactive students must contact their academic advisor to update their expected graduation date and discuss applying for graduation; in some cases, applying for readmission for graduation purposes may be necessary. Inactive students who do not need to make changes can go directly to file an application for graduation.

All course work, whether taken at UCR or elsewhere, must be completed by the last day of UCR's finals week during the quarter of graduation (no GDs or Incomplete grades). Incomplete, IE, IP or GD grades on the transcript will stop the processing of the degree.

Once the application for graduation is filed, the student's name will be entered on the appropriate degree list. Students who need to amend the prospective quarter of graduation and who have submitted an application for graduation petition must notify their Academic Advisor, in writing, as soon as possible.

Withdrawals

Students may withdraw from the university prior to the end of instruction, for serious personal reasons, with the approval of the associate dean. Students can initiate the withdrawal process online by going to myforms.ucr.edu. Students should review the tuition and fee refund table (registrar.ucr.edu) and speak to their financial aid counselor prior to withdrawal to understand any potential financial impact.



Preparing for the Professions

The wide variety of majors and programs available in the College of Humanities, Arts, and Social Sciences provides an excellent background and preparation for immediate entry into the job market or for graduate and professional schools. Some of these are listed below; however, students are urged to see their faculty advisor or a counselor in the Career Center for further information.

The Arts

Undergraduate majors in the arts at UCR are designed to provide a solid liberal arts education at the same time as they provide essential training in the practical techniques of the specific art field involved. This means that arts majors provide a broad educational background, on a par with the other majors in the college, which prepares each student for effective participation in any job market where educational breadth is important.

Through the thorough practical training in each art field, an increasing number of UCR students are finding attractive career opportunities in the visual arts, writing, dance, music, and theater arts. Not that it has become any easier to practice as an artist or performer; these remain options best followed by the most talented and determined. However, the opportunities in many arts-related fields are increasing as the role of the arts continues to expand. Such opportunities include positions in teaching, music and dance therapy, graphics, theater management, costume design, performing arts management, fine arts publication, the recording industry, the arts, and criticism. Moreover, new professions, which will open yet wider vistas in coming years, are evolving for those trained in the arts.

UCR students who graduate with a major in one of the arts have consistently gained admission to graduate schools at outstanding universities, conservatories, and professional schools throughout the country.



At UCR, students may major in Art, Art History, Creative Writing, Dance, Media and Cultural Studies, Music, or Theatre, Film and Digital Production. At the graduate level, the M.A. degree is offered in Art History and in Music. M.F.A. degrees include Experimental Choreography, Visual Art, and Creative Writing and Writing for the Performing Arts. A Ph.D. is offered in Critical Dance Studies.

The Chancellor provides performance awards for excellence in the arts for students who have already achieved high proficiency upon entry into the university and who will continue to practice their art forms while students at UCR. For further information, contact the departments of Art; Dance; Music; Theatre, Film and Digital Production; and Creative Writing.

The Gluck Fellows Program of the Arts at UCR provides Gluck Faculty, Graduate, and Undergraduate Fellows the opportunity to bring their respective art forms to elementary, middle, and high school students and nursing home residents who have little or no access to the arts. The departments of Art; Art History; Creative Writing; Dance; Music; and Theatre, Film and Digital Production as well as the Sweeney Art Gallery and UCR/California Museum of Photography participate in the Gluck Fellows Program of the Arts. Students interested in the Gluck Fellows Program of the Arts should check with individual departments.

Business

While no specific major is required for admission to most graduate schools of administration or management, the undergraduate programs in Business Economics and the various majors offered in combination with Administrative Studies provide excellent preparation. At UCR, the curriculum in these majors stresses the principles of managerial decision making and methods of gathering and analyzing the diverse data on which decisions must be based.

It is also important to note that other majors in the liberal arts can serve as effective preparation for entry into the worlds of management and business. Any major curriculum that includes substantial emphasis on oral and written expression and analytic and critical thinking can serve this purpose, particularly if accompanied by a suitable cluster of courses in business and management topics. Internships, which are available in business and industry settings, can assist in clarifying educational and personal goals, allowing exploration of alternative career options, and providing the opportunity to apply academic background to a practical, real world experience.

Students who wish to pursue a graduate degree in the Business Administration field may wish to consider UCR's School of Business.

Law

Most law schools require a baccalaureate degree. Law schools do not require a uniform prelaw course of study or a specific college major; backgrounds in the physical sciences are as acceptable as those in the social sciences and humanities. However, law schools in general do recommend that the prelaw student attempt to reach several goals during the undergraduate years: an understanding of the development of social, political, and economic institutions; an ability to communicate well, both orally and in writing; the capacity to think clearly, carefully, and independently; and a habit of disciplined study. Therefore, there is no specific, formal prelaw curriculum that a student must take.

Most law schools require applicants to take the Law School Admission Test, administered regionally by the Educational Testing Service.

Students who are considering applying to law schools are strongly urged to consult with the advisors in the Department of Political Science, 2203 and 2205 Watkins Hall.

Librarianships

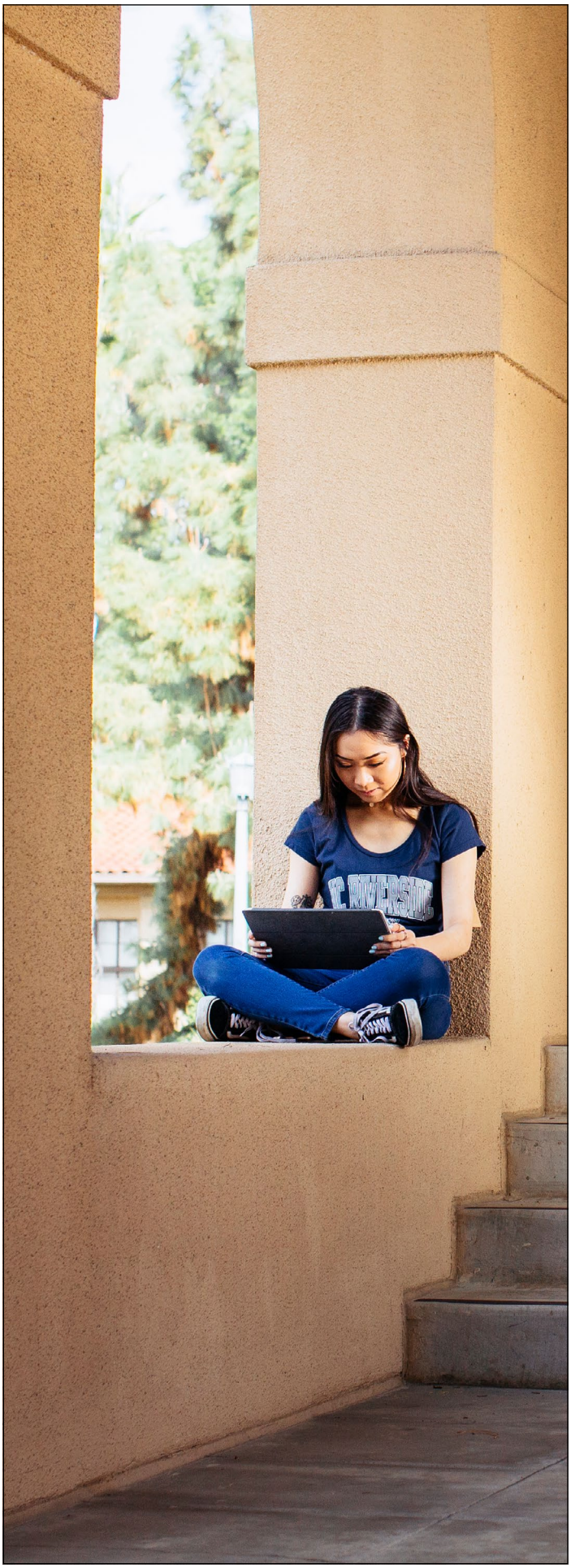
All library schools accredited by the American Library Association require a baccalaureate degree for admission and usually a reading knowledge of one or two languages other than English. A broad general background, supported by the ability to read rapidly and intelligently, is helpful. The knowledge, in depth, of the literature of some subject area is especially advantageous. All subject fields, including the biological and natural sciences, the humanities, and the social sciences may prepare a student for graduate study in librarianship.

In addition to career opportunities in public, school, and academic libraries, special librarians may work in government agencies, and in commercial and industrial firms, such as pharmaceutical companies, banks, and advertising agencies.

Museums, Archives, and Historic Preservation

The American Association of Museums and The Society of American Archivists have designated the master's degree as the professional degree level for careers in museums and archives. The Public History Program M.A. (Department of History) provides professional education and training for these careers, as well as for careers in general historic preservation and public history.

The UCR/California Museum of Photography is of significant value to those interested in photographic history and museum practices, as well as to those with creative interests in photography.



Public Administration
Government agencies offer many administrative career options including jobs in personnel, budget administration, labor relations, program analysis and public information. These types of positions may require a bachelor's or a master's degree or a combination of degrees plus experience. Students interested in a career in public information are encouraged to acquire a broad liberal arts education at the undergraduate level. An undergraduate major in any of the social sciences provides appropriate preparation for graduate work in public administration. Special attention is called to the majors in Political Science/Administrative Studies, Political Science/International Affairs, and Political Science/Public Service.

At UCR, students may gain valuable experience in government agencies through the Academic Internship Program. In addition to numerous local internship settings, there are quarter-away internships available in several Sacramento and Washington, D.C. offices. See the Career Center in the Services for Students section of this catalog.

UC Center Sacramento (UCCS) offers student internship opportunities. Students live in UC housing, near the state Capitol, and intern from 24 to 33 hours per week with members of the state legislature, government offices, or nonprofit agencies. See UC Center Sacramento (UCCS) in the Introducing UC Riverside section of this catalog.

The **UC Washington Center (UCDC)** provides undergraduate students with a multidimensional educational experience in Washington, D.C. Students undertake academic pursuits as well as cultural and social activities. The program combines course work with field research and internship experience. See UC Washington Center (UCDC) in the Introducing UC Riverside section of this catalog.

Social Welfare
Full professional training usually consists of two years of graduate training leading to the degree of Master of Social Work.

Students planning to seek employment in social welfare after completing the baccalaureate degree should prepare in the fields of psychology (particularly child and adolescent psychology and the study of personality), sociology (with emphasis on society and personality, social thought and social organization), economics, political science, anthropology, and statistical and research methods in the social sciences. Students who plan to enter a professional school of social work following undergraduate training should consult with an advisor at UCR for the best selection of classes.

Career opportunities for students with the B.A. or B.S. degree include positions as deputy probation officer, social worker, group counselor, corrections officer, substance abuse counselor, and community relations worker. Internships provide useful experience as part of the undergraduate program in preparation for such careers.

Teaching Credential Programs
Students planning a career as a teacher may wish to consider one of the majors that offers a subject-matter preparation program.

Specific details and counseling are available at individual department offices and the School of Education and at **education.ucr.edu**.

Students who are considering working toward any teaching credential should attend one of the credential information seminars offered by the Teacher Education Services Office (1124 Sproul) for advice in planning an academic program.

College of Natural and Agricultural Sciences

CNAS Undergraduate Academic Advising Center
1223 Pierce Hall
University of California, Riverside
Riverside, CA 92521
(951) 827-7294
cnasstudent.ucr.edu

The College of Natural & Agricultural Sciences (CNAS) is home to world-renowned scholars pursuing research that deepens our knowledge of the universe we live in and improves the quality of life for inhabitants of the state, the nation, and the world. Central to this research is educating the students who come to CNAS to learn science, and who leave with an integrated grasp of how they can change the world. These students, and the faculty who teach them, benefit from a structure that is unique among land-grant colleges: CNAS's 13 departments encompass the life, physical, mathematical, and agricultural sciences. This structure encourages an extraordinary degree of collaboration, reflected in the interdisciplinary research centers and the many cooperatively taught degree programs. Modern science is team based, and CNAS embodies that principle in everything it teaches and practices. For more information about CNAS, please visit cnas.ucr.edu.

The variety of degree programs and the flexibility of each provide great freedom of choice to students. Cooperative efforts between departments in the college provide for interdepartmental (interdisciplinary) majors. Students may elect to complete double majors within the college or between this college and another. See the college's Undergraduate Academic Advising Center for information on double majors. Individual majors may be planned for students who find that individual goals can be accommodated through the resources and interested faculty at UCR. Information and regulations on individual majors may be obtained from the college's Undergraduate Academic Advising Center.

For information on graduate degrees see the Graduate Studies section of this catalog.

Majors

A major is a coordinated group of upper-division courses (100-199 series) in a field of specialization. Early choice of a major is desirable. Students must declare a major by the time they have earned 90 units. The courses for any particular major are specified by the relevant department or departmental group, and they must provide at least 36 upper-division units of credit, normally taken on a letter grade basis. No more than 84 units in any one discipline may be applied to the degree.

Admission to Majors

First Year Admission

Applicants to majors in the College of Natural and Agricultural Sciences who excel in the academic criteria, with additional emphasis on advanced mathematics and laboratory science preparation, will be considered. It is recommended that students have sufficient mathematics competency to qualify for college-level calculus at the time of enrollment.

Math Placement Assessment (MPA)
All incoming CNAS first year students who are not exempt must take the Math Placement Assessment (MPA) prior to attending the summer Highlander Orientation. Certain MPA scores that indicate the need for additional work in college preparatory math will place students in a college-level mathematic fundamentals course. This means that these students will need to complete an a college mathematics fundamentals and problem solving course prior to enrolling in any Science and Math courses required for CNAS majors. Students will have the option to enroll in the college mathematics fundamentals course during the summer prior to their first Fall quarter at UC Riverside or, at the latest, during their first Fall quarter.

MATH 003 College Mathematics and Problem Solving is designed to give students the math proficiency to succeed in a rigorous, university level pre-calculus mathematics course. Successful completion of Math 003 will result in placement at Math 006A. Math 003 is only available at UCR.

Students who place in but do not complete Math 003 by the end of their first quarter of enrollment at UC Riverside, should file a Change of Major Petition to an appropriate, non-Calculus-requiring major in the College of Humanities, Arts, and Social Sciences (CHASS) or petition the Divisional Dean of CNAS Student Affairs to remain in CNAS under special circumstances. Students who pass Math 003 at a level deemed satisfactory for CNAS students, will be advised to enroll in Math 006A for the following quarter at UC Riverside.

Transfer Students
Students are selected primarily on the basis of academic preparation, as assessed by their GPA in academic coursework and strength of preparation for the intended major. Admission is selective based on the GPA in all transferable coursework with a minimum GPA of 2.7 and completion of required major preparatory coursework. Students should visit assist.org for updated and comprehensive major preparation requirements.

The **Intersegmental General Education Transfer Curriculum (IGETC)** is not accepted for students planning to transfer to the College of Natural and Agricultural Sciences. Although courses taken to satisfy the IGETC may be applied to the college's breadth pattern, students should concentrate on completing transferable mathematics and science courses.

Choosing a Major, Undeclared Majors

Although first year students may choose an academic major upon entering UCR, those who are unsure about specific academic goals may request to be admitted to the college as an undeclared student, choosing one of three options in this category.

1. **Undeclared — Life Sciences**, for students interested in Biochemistry; Biology; Cell, Molecular and Developmental Biology; Entomology; Microbiology; Neuroscience; or Plant Biology.
2. **Undeclared — Mathematical Sciences**, for students interested in Data Science; Mathematics; Mathematics for Teachers of Secondary School; or Statistics
3. **Undeclared — Physical Sciences**, for students interested in Chemistry, Earth Sciences, Environmental Sciences, Geology, Geophysics or Physics

Students who follow the recommended program for any of the three undeclared options will be prepared to enter a wide variety of science majors. Individuals entering as students in one of the three undeclared options are advised through the college's Undergraduate Academic Advising Center by both professional academic advisors and faculty mentors from diverse science departments. Actual admission into degree programs is predicated upon successful completion of courses with satisfactory grades. Transfer into another college requires performance judged to be satisfactory by that college.

All students with 90 or more units toward a degree are expected to declare a major. To declare a major, obtain approval from the college's Undergraduate Academic Advising Center by filing a Change of Major Petition. Students are expected to declare a major by the beginning of their junior year (completion of 90 units). **Students who fail to declare a major by this time will not be permitted to register until an approved declaration of major has been submitted to the Divisional Dean of CNAS Student Affairs at the CNAS Undergraduate Academic Advising Center.**

If students in one of the three undeclared options feel their interests lie primarily in the areas of humanities or social sciences, advising can be obtained in the College of Humanities, Arts, and Social Sciences, (951) 827-3683. Students interested in engineering or computer science and engineering can be advised in the Bourns College of Engineering, (951) 827-ENGR (3647). Students interested in public policy can be advised in the School of Public Policy, (951) 827-2334. Students interested in education can be advised in the School of Education, (951) 827-5850.

Double Majors

A declaration of a second major must be filed at the college's Undergraduate Academic Advising Center at least two quarters before graduation and approved by your academic advisor and the Divisional Dean of CNAS Student Affairs. At the time of filing, a student must have completed 120 units, with at least 18 upper-division units in the primary major and at least 8 upper-division units in the secondary major. Of the required upper-division units, a minimum of 24 (no more than 4 of which can be 190-199 courses) must be unique to each major. To declare a second major, a student must have a cumulative GPA of 2.7 or higher and

an upper-division major GPA of 2.7 or higher in each major. A student may elect a second major in a department or interdepartmental group of another college. A declaration of such a second major must be signed by the appropriate deans of both colleges and filed by the student with the primary college. A student must meet requirements of both primary and secondary majors and the college requirements of the primary major if they are both in the same baccalaureate class. If the two majors lead to different degrees (B.S. and B.A.), that fact is noted on the transcript, but only one diploma indicating both degree designations will be issued upon successful completion of such a program. Furthermore, if the double major is a mixed B.S./B.A., the college requirements for both majors must be met. Information on how to file for double majors may be obtained from the college's Undergraduate Academic Advising Center.

Changing Majors

Students may change majors if they are in good standing and not expected to exceed the unit limitation of 216 units toward the degree. Students can petition to change their major within the college or transfer from another college to the College of Natural and Agricultural Sciences. Students interested in transferring to the College of Natural and Agricultural Sciences should consult specific 'change of major' criteria located at **cnasstudent.ucr.edu** regarding specific prerequisite courses. Students will be reviewed for course coverage and GPA for the new major. Major changes to CNAS or within CNAS are approved by the Divisional Dean of CNAS Student Affairs.

Students who fail to attain a GPA of 2.00 ("C") in preparation for the major or major courses may be denied the privilege of entering or continuing in that major.

Minors

Each minor in the College of Natural and Agricultural Sciences consists of not fewer than 20 nor more than 28 units of organized, upper-division courses. No more than 4 units of 190-199 courses may be used in fulfilling the upper-division unit requirement for a minor. Of the specified upper-division units, a minimum of 16 must be unique to the minor and may not be used to satisfy major requirements. The CNAS Undergraduate Academic Advising Center is responsible for student and administrative issues pertaining to the minors offered by CNAS. Minors offered by other colleges are administered by the department, program, or interdisciplinary program offering the minor. Students must file a declaration of a minor by filing a petition with the college's Undergraduate Academic Advising Center at least one quarter before graduation and must be in good academic standing at the time of filing. A minor requires signature of the Lead Academic Advisor for the requested minor and the signature of the Divisional Dean of CNAS Student Affairs.

University Honors Program

For a description of the University Honors Program, see Educational Opportunities in the section Introducing UC Riverside. For a listing of requirements and courses, refer to University Honors Program in the Programs and Courses section.

Financial Assistance

The College of Natural and Agricultural Sciences maintains funds for undergraduate scholarships. General information is available in the college's Undergraduate Academic Advising Center. Visit https://cnasstudent.ucr.edu/scholarship-opportunities or e-mail **cnasstudent@ucr.edu**.

First Year Advising Seminars

First Year Advising Seminars are designed to introduce students to a wide variety of topics in the College of Natural and Agricultural Sciences, including major selection, curriculum planning, career options and goals in the sciences, opportunities for undergraduate research, development of learning and study skills, ethics in research and education, and an introduction to the faculty in the college. Each quarter's offerings are listed at **registrar.ucr.edu** under NASC 091, NASC 092 and NASC 093. Topics vary from quarter to quarter.

The seminars have no prerequisites, and first year students are given enrollment priority. Each seminar is limited in size to encourage discussion and carries 1 or 2 units of academic credit, although units are not applied toward major requirements. The seminars are graded on an "S/NC" basis.

Disciplinary Minors

Statistics	**Global Climate Change**
Chemistry	**Mathematics**
Entomology	**Neuroscience**
Environmental Sciences	**Physics**
Geology	**Plant Biology**

[1] Registration in this program is not open at present.
[2] A combined B.S.+M.S. program is offered in this discipline (designed to lead to a B.S. degree as well as an M.S. degree in five years).



College of Natural and Agricultural Sciences

Undergraduate Majors and Options

Department/Program	Degree	
Biochemistry		
Biology emphasis	B.A.	B.S.
Chemistry emphasis	B.A.	B.S.
Medical Sciences emphasis	B.A.	B.S.
Biological Sciences[1]		B.S.
Biology	B.A.	B.S.
Cell, Molecular, and Developmental Biology	B.A.	B.S.
Chemistry	B.A.	B.S.
Chemical Physics option		B.S.
Chemistry with Education Focus option		B.S.
Environmental Chemistry option		B.S.
Earth Sciences		
Climate Change	B.A.	B.S.
Geobiology	B.A.	B.S.
Geophysics	B.A.	B.S.
Geosystems		B.S.
Geology		
Geophysics		B.S.
Entomology	B.A.	B.S.
Environmental Sciences		
Atmospheric Sciences	B.A.	B.S.
Environmental Management	B.A.	B.S.
Environmental Toxicology	B.A.	B.S.
Hydrologic Sciences	B.A.	B.S.
Soil Sciences	B.A.	B.S.
Mathematics		
Pure Mathematics	B.A.	B.S.
Applied Mathematics		
Biology option	B.A.	B.S.
Chemistry option	B.A.	B.S.
Economics option	B.A.	B.S.
Environmental Sciences option	B.A.	B.S.
Physics option	B.A.	B.S.
Computational Mathematics	B.A.	B.S.
Data Science		B.S.
Mathematics for Secondary School Teachers		B.S.
Microbiology[2]	B.A.	B.S.
Neuroscience	B.A.	B.S.
Physics	B.A.	B.S.
Applied Physics and Engineering		B.S.
Astrophysics optioin		B.S.
Biophysics option		B.S.
Physics Education		B.S.
Plant Biology	B.A.	B.S.
Statistics[2]	B.A.	B.S.
Statistical Computing option		B.S.
Quantitative Management option		B.S.

Degree Requirements

Students in the College of Natural and Agricultural Sciences must meet three levels of requirements for the B.A. or B.S. degree: general university requirements, college requirements, and major requirements.

General University Requirements

General university requirements are listed at the beginning of the Undergraduate Studies section. For information on university regulations see the Policies and Regulations section of this catalog.

In addition to the above general university requirements, the College of Natural and Agricultural Sciences has the following unit requirement.

Unit Requirement

Students are not normally expected to take significantly more than 180 units to obtain the bachelor's degree. After earning credit for 216 units, a student will not be permitted to continue except by approval of the Divisional Dean of CNAS Student Affairs when specific academic or professional reasons are involved.

The following credit limitations apply for all students enrolled in the college:

1. After completing 105 quarter units at a community college, students are not allowed further units for courses completed at a community college.
2. No more than 6 units in physical education activity courses may be applied toward the bachelor's degree.
3. Enrollment in more than 8 units of graduate courses requires submission of a petition and approval by the Divisional Dean of CNAS Student Affairs. No more than three courses in the 300 series of courses may be applied toward the bachelor's degree. Credit is not granted for 400 series courses taken in UC Extension.

College Policy for the Intersegmental General Education Transfer Curriculum

The Intersegmental General Education Transfer Curriculum (IGETC) is not accepted for students planning to transfer to the College of Natural and Agricultural Sciences. However, courses taken to satisfy the IGETC may be applied to the college's breadth pattern.

College Breadth Requirements

For the following requirements, a course is defined as a block of instruction that carries credit of 4 or more units. Courses taken in the department or program of a student's major (including courses cross-listed with the major) may not be applied toward the breadth requirements except for Biology majors in connection with the Biological Sciences requirement. However, courses outside the major discipline, but required for the major, may be applied toward satisfaction of these requirements.

Some majors in the college may have specific course requirements for meeting the following breadth requirements. Check under individual major requirements in the Programs and Courses section of this catalog.

Requirements are for both the B.A. and the B.S. degrees unless specified separately.

Humanities

For the B.A. degree: 20 units

1. One course in World History (At UCR, courses that satisfy this requirement are HIST 010, HIST 015, or HIST 020.)
2. One course in the fine arts (Art; Art History; Creative Writing courses in poetry, fiction, or playwriting; Dance; Media and Cultural Studies; Music; Theatre or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences)

College of Natural and Agricultural Sciences

Breadth Requirement Unit Summary

For the B.A.

English Composition	Varies
Humanities	20
Social Sciences	16
Ethnicity (4 units)[1]	—
Foreign Language (level 4)	16
Natural Sciences and Mathematics	20
Total Units	**72 plus English Composition**

For the B.S.

English Composition	Varies
Humanities	12
Social Sciences	12
Ethnicity (4 units)[1]	—
Natural Sciences and Mathematics	20
Additional Courses	16
Total Units	**60 plus English Composition**

[1] The 4-unit ethnicity requirement can be applied to either the Humanities or Social Sciences requirement, depending on content.

3. Two courses from among the following:
   a) Literature taken in the departments or programs in Comparative Literature and Foreign Languages, English, Media and Cultural Studies, Hispanic Studies, or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences.
   b) Philosophy, taken in the Department of Philosophy, or from among courses within this discipline as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
   c) Religious Studies, taken in the Department of Religious Studies, or from among courses within this discipline as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
4. One additional course from the following:
   a) History, the Fine Arts, Literature, Philosophy, Religious Studies
   b) A foreign language at level 4 or above
   c) A humanities course offered by Ethnic Studies; Comparative Ancient Civilizations; Creative Writing (courses in journalism); Gender and Sexuality Studies; Humanities, Arts, and Social Sciences; Latin American Studies; Linguistics; or Media and Cultural Studies

No course used to satisfy the English Composition requirement will apply toward Humanities credit.

No more than two courses in performance may be counted toward the Humanities requirement.

English Composition

Students must demonstrate adequate proficiency in English Composition by completing a one-year sequence of college-level instruction in English Composition, with no grade lower than C. Courses in the Writing Across the Curriculum (WAC) program and other alternatives approved by the Academic Senate to the sequence's third-quarter course, WRIT 030 or WRIT 030S, may be applied toward satisfaction of the third quarter requirement if a student's college permits its majors to substitute such a course for WRIT 030 or WRIT 030S, and if students have first passed WRIT 020 or WRIT 020S with a "C" or higher. The grade in the alternative course must be no lower than a "C." Individual colleges may set a higher GPA requirement in WRIT 010 or WRIT 010S and/or WRIT 020 or WRIT 020S as a prerequisite to take Senate-approved alternatives to WRIT 030 or WRIT 030S.

Transfer students who have taken one semester of English Composition at another college or university are required to take WRIT 020 or WRIT 020S and WRIT 030 or WRIT 030S, with the option of taking a course in the WAC program and other alternatives to WRIT 030 or WRIT 030S approved by the Academic Senate if a student's college permits its majors to substitute such a course for WRIT 030 or WRIT 030S.

Students have the option of using a score of 3 on the College Board Advanced Placement Test in English to satisfy WRIT 010 or WRIT 010S; they must complete WRIT 020 or WRIT 020S and WRIT 030 or WRIT 030S.

Students with a score of 4 or 5 on the College Board Advanced Placement Test in English have satisfied WRIT 010 or WRIT 010S and WRIT 020 or WRIT 020S; they must complete WRIT 030 or WRIT 030S.

For the B.S. degree: 12 units

1. One course in world history (At UCR, courses that satisfy this requirement are HIST 010, HIST 015, or HIST 020.)
2. One course from among the following:
   a) Fine arts (Art; Art History; Creative Writing courses in poetry, fiction, or playwriting; Dance; Media and Cultural Studies; Music; Theatre or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences)
   b) Literature taken in the departments or programs in Comparative Literature and Foreign Languages, English, Hispanic Studies, Media and Cultural Studies or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
   c) Philosophy, taken in the Department of Philosophy, or from among courses within this discipline as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
   d) Religious Studies, taken in the Department of Religious Studies, or from among courses within this discipline as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
3. One additional course chosen from the following:
   a) History, the Fine Arts, Literature, Philosophy, Religious Studies
   b) A foreign language at level 3 or above
   c) Humanities courses offered by Ethnic Studies; Comparative Ancient Civilizations; Creative Writing (courses in journalism); Gender and Sexuality Studies; Humanities, Arts, and Social Sciences; Latin American Studies; Linguistics; or Media and Cultural Studies

No course used to satisfy the English Composition requirement will apply toward Humanities credit.

No more than one course in performance may be counted toward the Humanities requirement.

Social Sciences

For the B.A. degree: 16 units

1. One course must be taken in the departments of Economics or Political Science or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
2. One course must be taken in the departments of Anthropology, Psychology, or Sociology, or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
3. Social science courses offered by Ethnic Studies; Environmental Sciences; Geography (cultural geography courses); Human Development; Humanities, Arts, and Social Sciences; Women's Studies, or one of the disciplines in 1. or 2. above

For the B.S. degree: 12 units

1. One course must be taken in the departments of Economics or Political Science or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
2. One course must be taken in the departments of Anthropology, Psychology, or Sociology, or from among courses within these disciplines as designated by the Executive Committee of the College of Humanities, Arts, and Social Sciences
3. Social science courses offered by Ethnic Studies; Environmental Sciences; Geography (cultural geography courses); Human Development; Humanities, Arts, and Social Sciences; Women's Studies; or one of the disciplines in 1. or 2. above

Course work that may be taken to be used in partial satisfaction of the Humanities and the Social Sciences requirements must be evaluated by the college's Undergraduate Academic Advising Center. The college's Undergraduate Academic Advising Center, in consultation with the college Executive Committee, determines which courses apply to these requirements. It will implement this policy.

It is the student's responsibility to verify those courses that fulfill either the Humanities or the Social Sciences requirement, particularly the series of courses in cultural geography.

Ethnicity: 4 units

One course dealing with general concepts and issues in the study of race and ethnicity in California and the United States. Courses that satisfy this requirement must concentrate on one or more of four principal minoritized groups (African American, Asian American, Chicano/Latino, and Native American). These courses must be comparative in nature, analyzing the minoritized group experience within the present and historical context of other racial and ethnic groups. The courses are to be offered by or cross-listed with the Department of Ethnic Studies.

Regardless of the student's college and major, the course may be counted toward the Humanities or the Social Sciences graduation requirements, depending upon the course's content as evaluated by the College of Humanities, Arts, and Social Sciences Executive Committee. Check with the college's Undergraduate Academic Advising Center for the courses that fulfill the Ethnicity requirement.

Foreign Language

For the B.A. degree: 16 units

This requirement may be fulfilled in one language by completing course 4 with a minimum grade of "C" or demonstrating equivalent proficiency; or by completing course 2 with a minimum grade of "C" in each of the two languages; or by demonstrating equivalent proficiency (level 2) in each of two languages. American Sign Language may also be used to satisfy this requirement. Biology and Neuroscience majors must complete four quarters of one language. Students who are pursuing a B.A. degree and who have not completed a foreign language course may enroll in a level-1 foreign language course. However, students must take a placement exam if they plan to take a course in the same foreign language that they studied in high school. The placement exam may be taken only once in each subject during a student's UCR career. Transfer students who have taken a college-level foreign language course should consult with an advisor.

Natural Sciences and Mathematics: 20 units

1. One course in Mathematics, Statistics, or Computer Science
2. One course in Biological Sciences (Biochemistry, Biology, Entomology, Nematology, Plant Biology, or Plant Pathology); the course must include a laboratory
3. One course in Physical Sciences (Chemistry, Physics, Earth Sciences, excluding cultural geography courses)
4. Two additional courses from areas (2) or (3) above or in physical and/or biological science courses offered in the Department of Environmental Sciences

This requirement may automatically be satisfied by lower-division requirements for the major.

Additional Courses: 16 units

For the B.S. degree: An additional 16 units of substantive course work in the student's chosen major or fields related to the major is required. The additional course work is specified by the major department.

Major Requirements

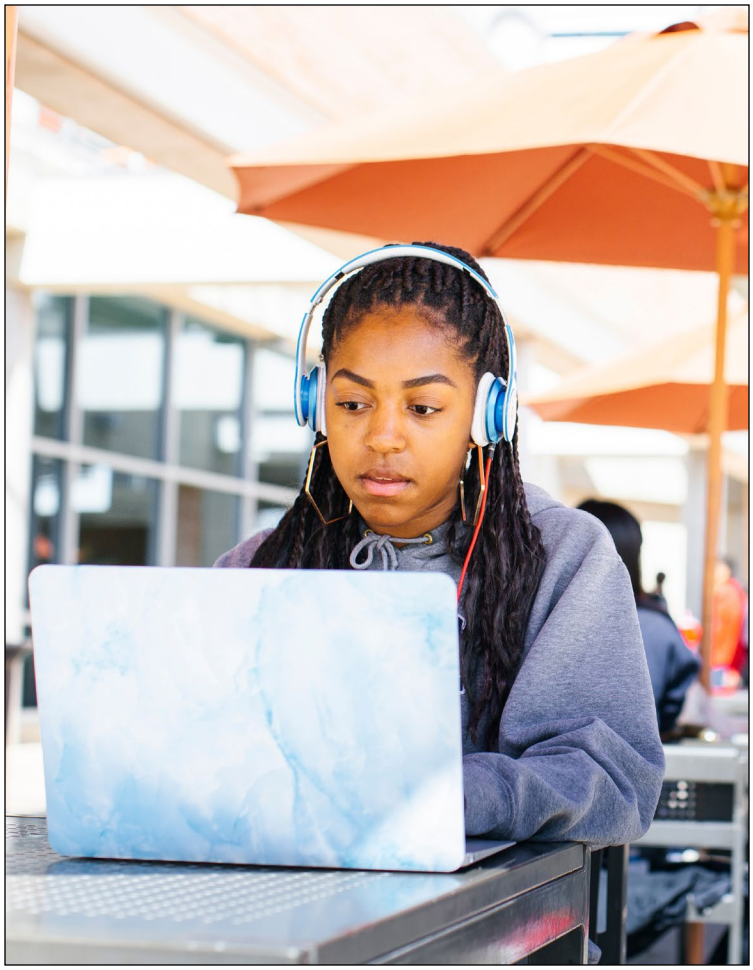
Detailed requirements for each major are found under the department listings in the Programs and Courses section of this catalog.

A major in the College of Natural and Agricultural Sciences shall consist of not fewer than 36 nor more than 60 upper-division units. No more than 9 units of courses in the 190-199 series may be counted in fulfilling the upper-division units needed for the major.

By the beginning of the junior year, students must consult with their advisor and choose a major. A GPA of at least 2.00 (C) in the upper-division courses taken in the major field is required for graduation.

College Policies and Procedures

For detailed information on UCR policies and regulations see the Policies and Regulations section of this catalog.



College Regulations

Detailed information and specifics with regard to the college regulations governing undergraduate student status as approved by the faculty and contained in the *Manual of the Riverside Division of the Academic Senate* may be obtained from a faculty advisor or the college's Undergraduate Academic Advising Center.

Student Responsibility

Students are responsible for meeting deadline dates regarding enrollment, add/drop, change of grading basis, credit by examination, withdrawal, applications for graduation, declaration of candidacy, and other actions. The deadline dates are listed at **registrar.ucr.edu** and must be observed. Academic advising can be obtained in the college's Undergraduate Academic Advising Center, 1223 Pierce Hall.

Faculty Mentors

All students who declare a major upon entrance to the College of Natural and Agricultural Sciences are assigned to a department or interdepartmental faculty oversight committee granting the degree for that major or area of specialization. For assignment of faculty mentors, new students should report to the Undergraduate Academic Advising Center. Students in one of three undeclared options in the college are also advised in the college's Undergraduate Academic Advising Center.

Professional Academic Advisors

Students should keep in touch with their professional academic advisor housed in the Undergraduate Academic Advising Center on all academic matters, including choice of courses, consideration of a major, and requirements for graduation. Before consulting the academic advisor, students should formulate a tentative program according to their interests and needs and should be familiar with general university, college, and major requirements.

It is important that each student keep in mind that the advisor serves to assist students but does not administer the student's program. Students must be responsible for ensuring that they meet all requirements for graduation.

Course Enrollment

Before each quarter, students advance enroll in all courses they plan to take. Students are expected to register and enroll by the date set by the campus (visit **registrar.ucr.edu** for details).

Since the college expects all students to make regular progress toward their degrees, class schedules of less than 12 units must be approved by the Divisional Dean of CNAS Student Affairs. Repeated courses are considered part of the total unit load.

Students on academic action may not register for more than 15 units in a quarter without consent of the Divisional Dean of CNAS Student Affairs. No student may enroll in less than 8 units (two classes).

During the first two weeks of the quarter, students make course enrollment changes via **rweb.ucr.edu**, and approvals by academic advisors and instructors are generally not required. After the second week of instruction ends, students must file an enrollment adjustment form online at **myforms.ucr.edu** to make changes. With the approval of their academic advisor and the course instructor, students may add courses to their class schedule up to noon on the end of the third week of classes. With the approval of their academic advisor, students may withdraw from a course up to noon on the end of the sixth week or change the grading basis up to noon on the end of the eighth week. For courses dropped after the second week, a "W" appears on the transcript, indicating withdrawal. Students may withdraw from all their courses up until the end of the tenth week of instruction. Students exercising this option will receive "W's" in all their courses for that quarter.

Enrollment on a Satisfactory/No Credit Basis

Students in this college who are not on academic action may take nonmajor courses on an "S/NC" basis and other courses graded only on an "S/NC" basis, provided they do not exceed one third of the total units undertaken and passed (graded "S") on the UCR campus at the time the degree is awarded.

Courses required for the major and lower-division mathematics or science courses that are prerequisites to major courses cannot be taken on an "S/NC" basis.

A student may elect "S/NC" or delete "S/NC" from a course during the R'Web enrollment period or later in the quarter by filing an enrollment adjustment form online at **myforms.ucr.edu**. The deadline is noon on the end of the eighth week of instruction and is listed each quarter at **registrar.ucr.edu**.

Regulations governing the "S/NC" option are described under Credit and Grades in the Policies and Regulations section of this catalog.

Credit by Examination

A student may petition for the privilege of examination for degree credit without formal enrollment in a particular course but must be in residence and not on academic action. Arrangements for examination for degree credit must be made with the student's faculty mentor. Approvals of the faculty mentor, the Divisional Dean of CNAS Student Affairs of the college, and the instructor who is agreeing to give the examination are necessary before the examination may be given. The results of all examinations for degree credit are entered on the student's record as though the student had actually taken the courses of instruction.

Undergraduate Credit for Graduate Courses

Upper-division students with a UCR cumulative GPA of 3.00 or above may take a graduate course for undergraduate credit with the permission of the faculty advisor and the instructor concerned. Enrollment in more than 8 units of graduate coursework requires Divisional Dean of CNAS Student Affairs approval. See the CNAS Undergraduate Advising Center for more information.

Expected Progress for Undergraduate Students

At the close of each quarter, the courses, units, grades, and grade points earned are added to the student's cumulative university record. This record summarizes progress toward a degree. UCR requires all undergraduate students to make Expected Progress each academic year. A full-time undergraduate student is considered to be making Expected Progress towards a baccalaureate degree if the student:

- Passes at least 45 units each academic year
- Declares a major by the time the student earns 90 units
- Follows a program of study consistent with the student's declared major

Students who have not earned a minimum of 37 units each academic year, have not declared a major by the time they earn 90 units, or are not following a program of study consistent with the student's declared major are not considered to be making Expected Progress towards a baccalaureate degree.

Students who fail to make Expected Progress may be ineligible for continued registration. Continued registration will be at the discretion of the Divisional Dean of CNAS Student Affairs.

Students can access their advisory degree audit through **rweb.ucr.edu**.

Declaration of Candidacy

Applications for graduation are available online at **Rweb.ucr.edu** and must be filed by the deadline established for the quarter in which graduation is expected. The deadline for filing applications for graduation is listed at **registrar.ucr.edu** each quarter. If it is necessary to amend the prospective date of graduation during the quarter in which graduation is expected, the student must notify the college's Undergraduate Academic Advising Center, in writing, as soon as possible.

Applications are not accepted after the deadline established for the quarter in which the student intends to graduate. If for any reason the student does not meet the requirements for graduation after announcing candidacy, or fails to meet the deadline for filing, a new application must be filed for the subsequent quarter.

Students graduating *in absentia* after an absence of three or more quarters and need to change their major, minor, concentration, or catalog year before they apply to graduate must apply for readmission to the university and file an application for graduation with the college Undergraduate Academic Advising Center. Students who do not need to make changes only have to file an application for graduation.

Preprofessional Academic Preparation

Undergraduate academic preparation for several professional careers can be acquired in the College of Natural and Agricultural Sciences. Brief explanations of preprofessional academic programs follow.

Forestry

Any Life Science major at UCR will be good preparation for students who wish to transfer to UC Berkeley's College of Natural Resources, forestry program. For more information on this program, please see visit their website **here**.

Health Professions and Pre-Law

The home to natural science curriculum and majors, the College of Natural and Agricultural Sciences provides an excellent preparation in developing the academic foundation to students who wish to prepare for a career in the health professions.

The college has a strong partnership with the Pre-Professional Advising Center (PPAC), a unit of the Division of Undergraduate Education, that provides information, advising, and support for students who aspire to graduate/professional programs in the health and law professions and wish to enhance their academic and extracurricular preparation. Professional staff and peer mentors are available to guide students as they plan their pre-professional coursework, health and law-related experiences, service work, and research in preparation for applying to programs.

The Pre-Professional Advising Center is located in Rivera Library B03. Additional information about the Pre-Professional Advising Center may be found on page 28.

The Thomas Haider Program at the UCR School of Medicine

Students in any major at UCR are eligible to complete admission requirements and apply for up to 24 positions reserved for UCR students in the UCR School of Medicine. Students eligible to apply to this unique pathway into the UCR medical school, called the Thomas Haider Program at the UCR School of Medicine, are those who attend UCR for at least six consecutive quarters and complete their bachelor's degree at UCR. Information on this program and general admission to the UCR medical school is provided at medschool.ucr.edu, in the school's section of this catalog, in the medical school Student Affairs Office.

Additional information about: **The Thomas Haider Program at the UCR School of Medicine – School of Medicine Student Affairs**.

Thomas Haider Early Assurance Program (EAP) at UCR School of Medicine:

The Haider Early Assurance Program (EAP) is a unique portal into the UC Riverside School of Medicine's Thomas Haider Program. It provides qualified, "mission-fit" UC Riverside undergraduate students or recent graduates with a guaranteed seat in a future UCR School of Medicine class. Admitted EAP students enter the School of Medicine one year after selection.

Additional information about: **Thomas Haider Early Assurance Program – School of Medicine Student Affairs**.



General Course Work for Health Professions Careers

Most health professions graduate/professional programs require/recommend the following course work:

- **General Chemistry 1 A/B/C series with Labs**
- **General Biology 5 A/B/C series with Labs**
- **Organic Chemistry 8 A/B/C series with Labs**
- **Physics 2 A/B/C series with Labs**
- **Biochemistry 100**
- **Upper-Division coursework such as Genetics, Microbiology, and Human Anatomy & Human Physiology**
- **Calculus (2 quarters)**
- **Statistics 10/40**

Teaching
The California Commission on Teacher Credentialing has established guidelines and standards that prepare students for teaching credentials. For a description of how students can prepare for the multiple-subject (elementary) and single subject (secondary) credentials, refer to individual departments in the Programs and Courses section of this catalog.

After earning the bachelor's degree, the prospective teacher registers for an additional year of training in education theory and practice needed to obtain a teaching credential. Anyone considering obtaining a teaching credential should attend one of the credential information seminars offered by the Teacher Education Services Office, 1124 Sproul Hall, and consult with an advisor early in the planning of an academic program.

California Teach-Science and Mathematics Initiative (CalTeach-SMI)
Students with a talent for science, math or engineering can translate that ability into preparing for a teaching career in California through the California Teach-Science and Mathematics Initiative (CalTeach-SMI). Students who partner with CalTeach-SMI at UCR can complete a science, engineering, or mathematics degree and become eligible for an intern teaching credential in just four years. Beginning with the first year, students intern in a local primary or secondary classroom with a mentor teacher. At UCR, they can meet other CalTeach-SMI students and their UCR peer mentor at the program's Resource Center, where students can receive credential advising. The CalTeach-SMI Resource Center also provides future STEM teachers with material and financial resources, such as the Scholar Apprentice Program. For more information contact **smi@ucr.edu**, visit the Resource Center at 1114 Pierce Hall, **smi.ucr.edu**.

The **Prepare to Teach Program** is a preprofessional program open to undergraduates from all majors who are interested in teaching in California elementary schools. Through this program, prospective elementary school teachers gain early field experience in the schools and learn more about the profession. Advising includes information on state requirements that are best met before graduation. For more information, contact the Office of Interdisciplinary Programs; 3116 Interdisciplinary Building South; or call (951) 827-2743.

The Marlan and Rosemary Bourns College of Engineering

Office of Student Academic Affairs
310 Skye Hall
University of California, Riverside
Riverside, CA 92521-0144
(951) 827-ENGR (3647); **student.engr.ucr.edu**

The Marlan and Rosemary Bourns College of Engineering emphasizes fundamental disciplines of engineering and computer science and engineering, introducing students to the new technologies necessary for today's highly technical environments.

The vision of the Bourns College of Engineering is to become a nationally recognized leader in engineering research and education. Its mission is to

- Produce engineers with the educational foundation and the adaptive skills necessary to serve rapidly evolving technology industries
- Conduct nationally recognized engineering research focused on providing a technical edge for the United States
- Contribute to knowledge in both fundamental and applied areas of engineering
- Provide diverse curricula that will instill in our students the imagination, talents, creativity, and skills necessary for the varied and rapidly changing requirements of modern life and to enable them to serve in a wide variety of other fields that require leadership, teamwork, decision making, and problem-solving capabilities
- Be a catalyst for industrial growth in the Inland Empire region of Southern California

The majors offered by the college are based on the needs of the practicing professional and are founded on a solid core of mathematics and the sciences. Breadth in the educational experience is represented by requirements in arts, humanities, and social sciences and by emphasis on oral and written communication skills. The principles and practice of engineering and computer science and engineering are provided in lecture and related laboratory courses. All students must choose a set of technical electives, emphasizing synthesis and design, to complete their undergraduate programs.

Majors

A major is a coordinated group of upper-division courses (courses numbered 100–199) in a field of specialization. The major may be a group of upper-division courses within a single department or program, or a group of related courses from several departments or programs. Before enrolling in upper-division courses, students may be required to gain appropriate knowledge by completing specific prerequisite courses. With the assistance of a departmental advisor, students are expected to select lower-division courses which prepare them for the advanced studies they propose to follow.

Change of Major or Double Majors

A student in good standing may request to change from one major to another by filing a Major Change Petition with the Office of Student Academic Affairs.

A student in good standing may elect to take a second major within the college. The student must file a declaration of a second major with the Office of Student Affairs. A course used to satisfy the requirements for one major may be used to fulfill the requirements of a second major as well. However, of the required upper-division units, a minimum of 24 must be unique to each major, and both majors must be completed within the maximum unit cap of the primary Engineering major.

A student in good standing may elect to take a second major in another college. A declaration of such a second major must be signed by the deans of both colleges and filed by the student with the primary college.

Bourns College of Engineering

Undergraduate Majors and Options

Major	Degrees
Bioengineering[1]	B.S.
Chemical Engineering[1]	B.S.
Biochemical Engineering	
Chemical Engineering	
Nanotechnology	
Computer Engineering[1]	B.S.
Computer Science and Engineering	B.S.
Computer Science with Business Applications	B.S.
Data Science	B.S.
Electrical Engineering[1]	B.S.
Environmental Engineering[1]	B.S.
Air Pollution Control Technology	
Water Pollution Control Technology	
Materials Science and Engineering	B.S.
Mechanical Engineering[1]	B.S.
Design and Manufacturing	
Energy and Environment	
General Mechanical Engineering	
Mechanics of Materials and Structures	
Robotics	B.S.

[1] A combined B.S.+M.S. program is offered in this discipline (designed to lead to a B.S. degree as well as an M.S. degree in five years).

A student will meet requirements of both primary and secondary majors and the college requirements of the primary major, if they are both in the same baccalaureate class. If the two majors lead to different degree designations (B.S. and B.A.), that fact will be noted on the transcript, but only one diploma indicating both degree designations will be issued upon successful completion of such a double major program. Furthermore, if the double major is a mixed B.S./B.A., the college requirements of both majors must be met. A course used to satisfy the requirements for one major may be used to fulfill the requirements for a second major as well. However, of the required upper-division units, a minimum of 24 must be unique to each major, and both majors must be completed within the maximum unit cap of the primary Engineering major. A student who has declared a double major may graduate in one major upon the completion of all requirements for that major but may not continue in the university for completion of the second major. For details, please contact the Office of Student Academic Affairs.

Minors

The Bourns College of Engineering currently has a minor in Computer Science. Minors in the college shall consist of not fewer than 20 nor more than 28 units of organized upper-division courses. No more than 4 units of 190–199 courses may be used in fulfilling the upper-division unit requirement for a minor. Overlap may occur between the upper-division course requirements of the major and the minor only to the extent permitted by the department, programs, or interdisciplinary committee offering the minor, or the college of the minor. Courses used, or prerequisite to those used, in fulfilling the minor may be taken on an "S/NC" basis only on approval of the dean. The department, program, or interdisciplinary committee offering the minor is responsible for student and administrative issues pertaining to the minor. Students must file a declaration of a minor at least two quarters before graduation and must be in good academic standing at the time of filing. A minor requires the signature of the department chair or chair of the faculty committee which supervises the minor and the signature of the dean of the college. A GPA of at least 2.00 in upper-division courses in the field of the minor is a graduation requirement. When all other requirements for graduation have been met, the student will be graduated without the minor if the minimum GPA in the minor field has not been met.



University Honors Program

For a description of the University Honors Program, see Educational Opportunities section in the section Introducing UC Riverside. For a listing of requirements and courses, refer to University Honors Program in the Programs and Courses section of this catalog.

Admission to Majors

Admission of Freshmen Prospective Bourns College of Engineering students must complete high school programs that meet UC requirements as described in the Undergraduate Admission section of this catalog.

Course Work	Years
Algebra 2	2
Plane Geometry	1
Trigonometry (often contained in Precalculus or Algebra II, strongly suggested)	1/2
Chemistry or Physics, with laboratory (preferably both)	1

In addition, appropriate high school mathematics and science course work should include the following:

A supplemental screening process for majors in the Bourns College of Engineering places emphasis on the GPA earned in college preparatory course work, especially mathematics and science, and on aptitude test scores. Qualification for first-year calculus is also expected. UC-eligible students not qualifying for the preferred major are considered for admission to their alternate major.

Application should be made during the priority filing period (November 1–30).

Transfer Students

All transfer students must meet the UC requirements for admission as described in the Undergraduate Admission section of this catalog. The Bourns College of Engineering accepts completion of IGETC as satisfying the majority of the college's breadth requirements for transfer students. Some additional breadth coursework may be required after enrollment at Bourns. For more information on BCOE breadth requirements, please contact the Office of Student Academic Affairs.

However, prospective applicants are strongly encouraged to focus instead on preparatory course work for their desired major, such as mathematics, science, and other technical preparatory course work, rather than on IGETC completion. Strong technical preparation is essential for success in the admissions process, and subsequently, in all coursework at Bourns.

Students intending to transfer to engineering majors are expected to complete the equivalent of UCR course work required in the first two years of the programs and to apply for transfer starting with their junior year. Specific information on transfer requirements may be obtained from the Office of Student Academic Affairs, (951) 827-ENGR (3647).

Financial Assistance

The Bourns College of Engineering awards several scholarships to its students each year from funds provided by corporate and private sponsors. Other scholarships are available. Further information may be obtained by calling the Office of Student Academic Affairs, (951) 827-ENGR (3647).

Special Facilities

See Research Opportunities in the section About UC Riverside in this catalog for a detailed description of the following centers:

- Center for Bioengineering Research
- Center for Environmental Research and Technology
- Center for Nanoscale Science and Engineering
- Center for Research in Intelligent Systems (including the Visualization and Intelligent Systems Laboratory)
- Center for Ubiquitous Communication by Light
- So Cal Research Initiative for Solar Energy
- Winston Chung Global Energy Center

Degree Requirements

Students in the Bourns College of Engineering must meet three levels of requirements for the Bachelor of Science degree: general university requirements, college requirements, and major requirements.

General University Requirements

General university requirements are listed at the beginning of the Undergraduate Studies section. For other UCR regulations including repetition of courses, concurrent enrollment, scholarship regulations, and incomplete (I) grades, see the Policies and Regulations section of this catalog.

In addition to the above general university requirements, the Bourns College of Engineering has the following unit requirement.

Unit Requirement

Most of the majors in this college require more than the nominal university requirement of 180 units for graduation. No more than 6 units of physical education activity may be counted toward this requirement. However, after having credit for 216 units or 120 percent of the units required for the major, a student is not permitted to continue except by approval of the dean when specific academic or professional reasons are involved.





College Breadth Requirements

All undergraduate students in the Bourns College of Engineering are required to satisfy the Campus Graduation Requirements mandated by the Academic Senate under Regulation R6. Detailed requirements are available in the Office of Student Academic Affairs. Internships and independent study courses may not be used to satisfy breadth.

Bourns College of Engineering

Breadth Requirement Unit Summary

For the B.S.

English Composition	Varies
Humanities	12
Social Sciences	12
Ethnicity (4 units)[1]	—
Natural Sciences and Mathematics	20
Total Units	**44 plus English Composition**

[1] The 4-unit ethnicity requirement can be applied to the Humanities or Social Science requirement, depending on content.

For the following requirements, a course is defined as a block of instruction that carries credit of 4 or more units.

To provide depth in satisfying breadth in the humanities and social sciences, at least two of the humanities and/or social science courses must be upper division.

English Composition

Students must demonstrate adequate proficiency in English Composition by completing a one-year sequence of college-level instruction in English Composition with no grade lower than "C." UCR's sequence is WRIT 010 or WRIT 010S, WRIT 020 or WRIT 020S, and one of WRIT 030 or WRIT 030S, or an approved alternative under Writing Across the Curriculum. Transfer students who have credit for one semester of English Composition from another institution must take two additional quarters (i.e., WRIT 020 or WRIT 020S and WRIT 030 or WRIT 030S).

Students have the option of using a score of 3 on the College Board Advanced Placement Test in English to satisfy WRIT 010 or WRIT 010S; they must complete WRIT 020 or WRIT 020S and either WRIT 030 or WRIT 030S or an approved alternative under Writing Across the Curriculum. Students with a score of 4 or 5 on the College Board Advanced Placement Test in English have satisfied WRIT 010 or WRIT 010S and WRIT 020 or WRIT 020S; they must complete WRIT 030 or WRIT 030S or an approved alternative under Writing Across the Curriculum.

Students should enroll in an English composition course each quarter they are registered at UCR until the sequence of preliminary Entry Level Writing courses, if needed, and WRIT 010 or WRIT 010S, WRIT 020 or WRIT 020S, and WRIT 030 or WRIT 030S or an approved alternative under Writing Across the Curriculum is completed with a satisfactory GPA. A student may not receive baccalaureate credit for any work in English Composition taken prior to completing the Entry Level Writing requirement.

Humanities: 12 units

Courses used to fulfill the Humanities requirements must be selected from an approved list available in the Office of Student Academic Affairs.

1. One course in World History
2. One course in one of the areas of Fine Arts, Literature, Philosophy, or Religious Studies
3. One additional course chosen from
   a) History, the Fine Arts, Literature, Philosophy, Religious Studies
   b) A foreign language at level 3 or above
   c) Humanities courses offered by Ethnic Studies, Creative Writing (courses in journalism), Humanities and Social Sciences, Latin American Studies, Linguistics, or Women's Studies

No course used to satisfy the English Composition requirement can be applied toward Humanities credit. A list of approved courses is available in the Office of Student Academic Affairs.

Social Sciences: 12 units

Courses used to fulfill the Social Sciences requirements must be selected from an approved list available in the Office of Student Academic Affairs.

1. One course from Economics or Political Science
2. One course from Anthropology, Psychology, or Sociology
3. One additional social science course offered by Ethnic Studies, Geography (cultural geography courses), Human Development, or Women's Studies, or one of the disciplines in 1. or 2. above.

At least two of the humanities and/or social science courses must be upper-division. The list of approved courses is available in the Office of Student Academic Affairs.

Ethnicity: 4 units

Courses used to fulfill the Ethnic Studies requirement must be selected from an approved list available in the Office of Student Academic Affairs.

One course dealing with general concepts and issues in the study of race and ethnicity in California and the United States. Courses that satisfy this requirement must concentrate on one or more of four principal minority groups (African American, Asian American, Chicano/Latino, and Native American). These courses must be comparative in nature, analyzing the minority group experience within the present and historical context of other racial and ethnic groups, such as European-American minorities. The courses are to be offered by or cross-listed with the Department of Ethnic Studies. The list of approved courses is available in the Office of Student Academic Affairs.

Natural Sciences and Mathematics: 20 units

Courses used to fulfill the Natural Sciences and Mathematics requirements must be selected from an approved list available in the Office of Student Academic Affairs.

1. One course in Biological Sciences
2. One course in Physical Sciences. No course in cultural geography may be used.
3. One course in Mathematics or Computer Science or Statistics
4. Two additional courses in the Biological or Physical Sciences

Check with the Office of Student Academic Affairs for the courses that fulfill the biological sciences, physical sciences, and additional sciences. In some cases, these are satisfied by requirements of the major. The mathematics/computer science/statistics requirement is always satisfied by a major requirement.

Major Requirements

Detailed requirements for each major are found under the department listings in the Programs and Courses section of this catalog, and are available from the Office of Student Academic Affairs, (951) 827-ENGR (3647). A GPA of at least 2.00 ("C") in upper-division courses taken in the major field is required for graduation. Not more than 9 units of courses in the 190-199 series may be counted in fulfilling the upper-division units needed for the major.

College Policies and Procedures

For detailed information on UCR policies and regulations see the Policies and Regulations section of this catalog.

College Regulations

Detailed information and specifics with regard to the college regulations governing undergraduate student status as approved by the faculty and contained in the *Manual of the Riverside Division of the Academic Senate* can be obtained from the Dean's Office.

Student Responsibility

Students are responsible for meeting deadline dates regarding enrollment, add/drop, change of grading basis, credit by examination, withdrawal, declaration of candidacy, and other procedures. The dates are at registrar.ucr.edu and must be observed. Students are responsible for ensuring that they meet all requirements for graduation and that they attend the undergraduate faculty advisor's annual forum. Students are also responsible for obtaining their grades, selecting an appropriate collection of courses, and confirming their enrollment by relevant deadlines. Academic advising can be obtained in the Office of Student Academic Affairs.

Faculty Advisors

All Bourns College of Engineering students are advised on a regular basis. In addition, each department designates a faculty undergraduate advisor who is the primary contact in the student's areas of academic interest. Faculty advisors assist students in their undergraduate careers, as appropriate, and are also mentors in the student's areas of interest.

Course Enrollment

Students should plan their program of study carefully, in consultation with an academic advisor. Class schedules of fewer than 12 units must have the approval of the Divisional dean of the college.

Students who have not met the Entry Level Writing Requirement must enroll in an Entry Level Writing or qualifier course, as determined by their placement, during their first quarter of residency.

Students must attend class meetings. Students who do not attend in accordance with any published requirement listed at registrar.ucr.edu or on a course syllabus may be dropped from the course.

Students may add or drop a course via R'Web through the second week of instruction. Beginning the third week of instruction, students must file an Enrollment Adjustment Form to make changes and obtain required approvals. During the third week of classes, students may, with the consent of the instructor and the approval of their academic advisor, add a course. Students may drop a course until the end of the sixth week of instruction, but courses dropped after the second week of instruction require an academic advisor's signature and result in a "W" (for withdrawal) noted on the transcript. Changes in enrollment after deadlines published at registrar.ucr.edu require the approval of the associate dean of the college.

A student on academic notice may enroll for more than 13 quarter units only with the consent of the associate dean of the college.

With the approval of the associate dean, students may withdraw from the university at any time prior to the end of instruction.

Any changes in a student's class schedule not covered by the above regulations must have the approval of the associate dean.

Enrollment on a Satisfactory/No Credit Basis

A student in good standing may enroll and receive credit for courses graded "S." However, the "S/NC" grading system cannot be used for any course that is used to fulfill major or breadth requirements, except for any required course which is restricted to "S/NC" grading and up to 8 units of courses in the humanities and social sciences. Exceptions to this policy may be granted, upon petition, by the student's advisor and the Executive Committee.

Students may change their grading basis in a course from letter grading to "S/NC" (or vice versa) up to the end of the eighth week of instruction.

Regulations governing the "S/NC" option are described under Credit and Grades in the Policies and Regulations section of this catalog.



Credit by Examination

A student may petition for the privilege of examination for degree credit without formal enrollment in a particular course, but must be in residence and not on academic notice. Arrangements for examination for degree credit must be made with the student's advisor. Approvals of the advisor, the dean of the college, and the instructor who is agreeing to give the examination are necessary before the examination may be given. The results of all examinations for degree credit are entered on the student's record as if the student had actually taken the courses of instruction.

Expected Progress for Undergraduate Students

At the close of each quarter, the courses, units, grades, and grade points earned are added to the student's cumulative university record. This record summarizes progress toward a degree. Lack of adequate progress may jeopardize continued registration. Students can access their advisory degree check through rweb.ucr.edu.

Declaration of Candidacy

Application for graduation is available in R'Web and must be filed by the deadline established for the quarter in which graduation is intended. The deadline for filing applications for graduation is listed at registrar.ucr.edu each quarter. Applications are not accepted after the deadline established for the quarter. If for any reason a student does not meet the requirements for graduation after announcing candidacy, or if a student fails to meet the deadline for filing, an application must be filed for a subsequent quarter.

California Teach-Science and Mathematics Initiative (CalTeach-SMI)

California Teach-Science and Mathematics Initiative (CalTeach-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CalTeach-SMI at UCR offers undergraduate students paid/unpaid opportunities, such as the Scholar Apprentice Program, to explore STEM teaching as a career option. Through CalTeach-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The CalTeach-SMI Resource Center provides future STEM teachers with material and financial resources to promote planning and professional development towards a science/mathematics education career.

For more information about the CalTeach-SMI program, please visit smi.ucr.edu, the Resource Center at 1114 Pierce Hall, or on Facebook at facebook.com/ScienceMathInitiativeAtUcr and on Instagram at instagram.com/smiatucr/.



School of Business

Student Affairs:
Graduate Programs:
The A. Gary Anderson Graduate School of Management:
900 University Ave.
(951) 827-6200; fax: (951) 827-2055

Undergraduate Programs:
Undergraduate Business Programs Office:
900 University Ave.
(951) 827-4551; fax: (951) 827-5061
business.ucr.edu

Mission Statement

The school is dedicated to the pursuit of excellence in substantive scholarly research enhancing the world's base of knowledge about organizations, their environments, and their management, and to the transmission of this knowledge through quality educational programs to students, alumni, business managers, and the public.

The School

The School of Business emphasizes growing strengths in the areas of marketing, supply chain management, accounting, and finance. The school resides in a 30,000-square-foot home featuring state-of-the-art research and teaching facilities.

The School of Business Microcomputer Facility offers software packages in statistics, databases, spreadsheets, financial planning, management science, econometrics, graphics, word processing, and Internet connections. The facility is used for teaching, class demonstrations, theses, and research projects. Students learn computing skills in business courses with special computing requirements, and in optional seminars.

The UCR Library, with more than 2 million bound volumes, 13,000 serials, and 1.6 million microforms, including extensive literature in the management field, provides substantial support for student and faculty research.

Student evaluations of courses are an important part of the evaluation of curriculum and faculty performance.

Undergraduate Program in the School of Business

The School of Business offers the UC's oldest and most comprehensive undergraduate Business Administration major in Southern California and is the first and only one in the UC system that offers the BS in Actuarial Science degree. The BS in Business Analytics is a new major offering an in-demand skillset that includes analyzing data to predict business decision outcomes and recommending solutions for growth. The School of Business houses The A. Gary Anderson Graduate School of Management, which offers the Master of Business Administration program (M.B.A.), the professional M.B.A. program, the Master of Professional Accountancy (M.P.Ac.) program, the Master of Finance (M.Fin.) program, Master of Science in Business Analytics (MSBA), and the Ph.D. program in Business Administration. The School of Business is accredited by AACSB International – The Association to Advance Collegiate Schools of Business. Visit business.ucr.edu.

Majors

A major is a coordinated group of upper-division courses (courses numbered 100-199) in a field of specialization. The major may be a program of upper-division courses within a single department (departmental major), a group of related courses involving a number of departments (interdisciplinary major), or a group of courses chosen to meet a special interest.

Before enrolling in certain upper-division courses, students may be required to gain appropriate knowledge by completing specific prerequisite courses. With the assistance of a departmental advisor, students are expected to select lower-division courses that prepare them for the advanced studies they propose to follow.

Choosing a Major, Undeclared Majors

While freshmen may choose an academic major on entering UCR, those who are unsure about specific academic goals may request to be admitted to CHASS as undeclared. These students often take introductory courses in the natural sciences, social sciences, humanities, and fine arts while searching for an area that most excites their interest. Undeclared majors are encouraged to meet with an advisor in the Student Academic Affairs Office in CHASS about their selection of courses.

Students with 90 or more units toward a degree must declare a major. To declare a major, students must obtain approval from the Student Academic Affairs Office by filing a Petition for Declaration of Major. Students who do not declare a major by 90 or more units may have a hold placed on their registration.

School of Business

Undergraduate Majors

Major	Degrees
Actuarial Science	B.S.
Business Administration	B.S.
Business Analytics	B.S.

Double Majors

Students can declare a second major in a department or program of another college. Changes are not permitted while on academic notice or during the final senior year (135 units or more). Both majors must be completed within the maximum limit of 216 units, and approval must be obtained from advisors in both departments or programs. In such cases, all course requirements must be completed for each of the two majors chosen. One of the two majors must be designated as the primary major for the purpose of satisfying breadth or general education requirements. No more than 8 upper-division units may count for both majors simultaneously.

A declaration of two majors in different colleges must be signed by the deans of the colleges concerned and filed by the student with the college of the principal major. If the two majors lead to different degrees (B.S. and B.A.), that fact will be noted on the transcript, but only one diploma indicating both degree designations will be issued upon successful completion of such a program. Furthermore, if the double major is a mixed B.S./B.A., the college requirements for both majors must be met.

Students wishing to declare a second major must present an outline to the Undergraduate Business Programs Office, indicating which major will be used to satisfy breadth requirements and any overlap courses between the two majors.

Internships, Independent Projects and Student Research

The School of Business student can often practice the subject, as well as read about it. Many undergraduates have the opportunity to work with a faculty member on a research project, and many departments offer field work and internship courses. In these courses, students combine several hours per week of experience in an agency or firm with study of related academic materials and participation in a seminar, where formal knowledge and practical experience are related to one another.

Normally, each local internship does not count for more than 4 or 5 units in a single term, larger numbers of units being reserved for quarter-away internships. Petitions for credit beyond 5 units in a single quarter for a local internship must have the sponsoring agency's approval and a written justification by the student's faculty sponsor. All such requests require the associate dean's approval.

A maximum of 16 units of credit toward the bachelor's degree may be obtained through internship courses, with a maximum of 12 units of internship scheduled in a single quarter for quarter-away situations. Students who are on academic notice may not enroll in internship courses.

Transfer of Majors, Changing Majors

Students in good academic standing can petition to transfer from another college to The School of Business. The petition must be approved by the Undergraduate Business Programs Office before the change can be processed by the Office of the Registrar. Changes are not permitted while on academic notice or during the final senior year (135 units or more).

Students who fail to attain a GPA of 2.00 ("C") in preparation for the major or courses required for the major may be denied the privilege of entering or continuing in that major.

Minors in Business

The School of Business offers minor programs; however, no student is required to take a minor. Minors are not degree-granting majors; they are sequences of supplemental courses designed to enhance work in certain areas. Any minor may be taken jointly with any departmental or interdepartmental major. Minors in the college shall consist of not fewer than 16 nor more than 28 units of organized upper-division course work. No overlap may occur among courses used to satisfy upper-division course requirements for a major and a minor. A GPA of at least 2.00 is required in upper-division courses in the field of the minor.

A minor is a set of courses focused on a single discipline or an interdisciplinary thematic area. There can be no substitution for the courses listed as constituting a minor without approval of the governing department or committee. There is no limit on the number of minors a student can declare. Students must declare the minor(s) before their final degree check before graduation by completing a petition with the Student Affairs Office in the College of Humanities, Arts, and Social Sciences, the College of Natural and Agricultural Sciences, the Bourns College of Engineering, or the School of Business, depending on their major. Prior approval by the department or committee offering the minor is required. The minor is noted on the transcript at the time the degree is conferred.

University Honors Program

For a description of the University Honors Program, see Educational Opportunities in the front of this catalog. For a listing of requirements and courses, refer to University Honors Program in the Programs and Courses section.

Undergraduate Pre-Business Program

Pre-Business is a two-year program that prepares students to apply to the School of Business major. Students who elect Pre-Business are advised in the College of Humanities, Arts, and Social Sciences during their first-year and sophomore years. Students who elect Pre-Business must gain admission to Business by the time they have earned 90 units.

Degree Requirements

Students in The School of Business must meet three levels of requirements for the Bachelor of Science degree: general university requirements, college requirements, and major requirements.

General University Requirements

General university requirements are listed at the beginning of the Undergraduate Studies section. In addition, The School of Business has the following requirements and limitations.

Unit Requirements

Students must satisfactorily complete for credit a minimum of 180 units for the bachelor's degree. A maximum of 216 units is allowed. After having credit for 216 units, students are not permitted to continue except in cases approved by the associate dean in which specific academic or professional reasons are involved.

Credit Limitations

Transfer students with credit from other institutions (advanced standing credit), receive a transfer profile from the Office of Undergraduate Admissions. The Undergraduate Business Programs Office evaluates the course work, indicating how the transferable credits are applied toward the degree. However, the following credit limitations may reduce the total number of units which apply toward the degree in The School of Business. Students should meet with an academic advisor in their major for questions regarding transfer credits.

The following credit limitations apply for all students enrolled in the college:

1. After completing 105 quarter units at a community college, students are not allowed further units for courses completed at a community college.
2. No more than 6 units in physical education activity courses may be applied toward the 180-unit requirement for the bachelor's degree.
3. No 400 series courses and not more than three courses in the 300 series of courses may be counted toward the 180 unit requirement for the bachelor's degree.
4. No more than 5 units of credit may be taken per quarter in special studies courses. See specific restrictions under each departmental listing regarding credit toward the major in special studies courses.

College Breadth Requirements

The Undergraduate Business Programs Office, in consultation with the Executive Committee of the School of Business, determines which courses apply to the following requirements. It is the student's responsibility to verify those courses that fulfill these subject requirements. To search for courses that meet specific breadth requirements, visit registrar.ucr.edu.

Courses taken in the department or program of a student's major (including courses cross-listed with the major) may not be applied toward the breadth requirements. However, courses outside the major discipline, but required for the major, may be applied toward satisfaction of these requirements. Students who elect a double major may apply courses in one of the majors toward satisfaction of the breadth requirements.

For the following requirements, a course is defined as a block of instruction which carries credit of 4 or more units.

No course may be applied to more than one breadth requirement, with the exception of the course taken to meet the Ethnicity requirement. Internship and independent studies courses may not be used to satisfy breadth requirements.



The School of Business

Breadth Requirement Unit Summary

For the B.S. in Actuarial Science

English Composition	12 units up to WRIT 030/030S (BUS 100W can be used for WRIT 030/030S with a grade of C or better).
Humanities	12
Social Sciences	8
Ethnicity (4 units)[1]	—
Natural Sciences and Mathematics	20
Additional Courses	12
Total Units	**56 plus English Composition**

For the B.S. in Business Administration

English Composition	12 units up to WRIT 030/030S (BUS 100W can be used for WRIT 030/030S with a grade of C or better).
Humanities	20
Social Sciences	16
Ethnicity (4 units)[1]	—
Foreign Language (level 3)	12
Natural Sciences and Mathematics	16
Total Units	**68 plus English Composition**

For the B.S. in Business Analytics

English Composition	12 units up to WRIT 030/030S (BUS 100W can be used for WRIT 030/030S with a grade of C or better).
Humanities	12
Social Sciences	8
Ethnicity (4 units)[1]	—
Natural Sciences and Mathematics	20
Additional Courses	12
Total Units	**52 plus English Composition**

[1] The 4-unit ethnicity requirement can be applied to either the Humanities or Social Sciences requirement, depending on content.

English Composition

Students must demonstrate adequate proficiency in English Composition by completing a one-year sequence of college level instruction in English Composition with no grade lower than "C." Students should enroll in an English composition course each quarter they are registered at UCR until the sequence of preliminary Entry Level Writing courses, if needed, and WRIT 010 or WRIT 010S, WRIT 020 or WRIT 020S, WRIT 030 or WRIT 030S is completed with satisfactory GPA.

Transfer students who have credit for one semester of English Composition from another institution are required to take two additional quarters, i.e., WRIT 020 or WRIT 020S and WRIT 030 or WRIT 030S.

Students have the option of using a score of 3 on the College Board Advanced Placement Test in English to satisfy WRIT 010 or WRIT 010S; they must complete WRIT 020 or WRIT 020S, and WRIT 030 or WRIT 030S or equivalent.

Students with a score of 4 or 5 on the College Board Advanced Placement Test in English have satisfied WRIT 010 or WRIT 010S and WRIT 020 or WRIT 020S; they must complete WRIT 030 or WRIT 030S or equivalent.

In lieu of WRIT 030 or WRIT 030S, students can complete their last quarter of the English Composition requirement by earning a "C" or better in BUS 100W. (As a prerequisite to either course, students must earn a "C" or better in WRIT 020 or WRIT 020S.)

Humanities: 20 units

For the B.S. degree

1. One course in World History (At UCR, courses that satisfy this requirement are HIST 010, HIST 015, or HIST 020.)
2. One course from the following:
   a) Fine arts (Art, Art History, Dance, Media and Cultural Studies, Music, Theatre, Creative Writing courses in poetry, fiction, or playwriting)
   b) Literature (taken in the departments of English, Comparative Literature and Foreign Languages, or Hispanic Studies)
   c) Philosophy
   d) Religious Studies
3. Three additional courses from the following:
   a) History, the Fine Arts, Literature, Philosophy, Religious Studies
   b) A foreign language at level 3 or above (Courses used in fulfillment of the foreign language requirement may not be used to meet this requirement.)
   c) Humanities courses offered by Ethnic Studies; Creative Writing (courses in journalism); Humanities, Arts, and Social Sciences Interdisciplinary; Latin American Studies; Linguistics; or Women's Studies

Social Sciences: 16 units

1. One course in Economics or Political Science
2. One course in Anthropology, Psychology, or Sociology
3. Two additional social science-related courses from Comparative Ancient Civilizations, Ethnic Studies; Environmental Sciences; Geography (cultural geography courses); Human Development; Humanities, Arts, and Social Sciences Interdisciplinary; Women's Studies; or one of the disciplines in 1. or 2. above.

Ethnicity: 4 units

One course focusing on the general concepts and issues in the study of race and ethnicity in California and the United States. Courses that satisfy this requirement must concentrate on one or more of four principal minority groups (African American, Asian American, Chicano/Latino, and Native American). These courses must be comparative in nature, analyzing the minority group experience within the present and historical context of other racial and ethnic groups, such as European-American minorities. The courses are to be offered by or cross-listed with the Department of Ethnic Studies.

Refer to the Programs and Courses section for the courses that fulfill the Ethnicity requirement.

Foreign Language

Courses in American Sign Language may be used to meet this requirement.

For the B.S. degree in Business Administration: course level 3 or equivalent

This requirement may be satisfied by students (except for foreign language majors who satisfy the spirit of the language requirement by majoring in one or more languages) by completing the third-quarter level or its equivalent in one language at UCR (or at another college or university) with a minimum grade of "C" or by demonstrating proficiency at the third-quarter level on a foreign language placement exam offered by one of the foreign language departments at UCR. This test does not yield unit credit; it only determines whether the Foreign Language requirement has been met, or in which course of the language sequence a student should enroll. The placement exam may be taken only once in each subject during a student's UCR career. Students continuing with the same foreign language they completed in high school must take a placement exam (visit placementtest.ucr.edu for dates and locations). Credit will be allowed only at the course level for which they qualify according to the placement exam.

Natural Sciences and Mathematics: 20 units

1. One course in Mathematics, Statistics, or Computer Science
2. One course in Biological Sciences (Biochemistry, Biology, Botany and Plant Sciences, Entomology, Nematology, or Plant Pathology)
3. One course in Physical Sciences (Chemistry, Physics, Earth Sciences, excluding cultural Geography courses)
4. Two additional courses from the areas listed above or in physical and/or biological science courses offered in the Department of Environmental Sciences

Major Requirements

Detailed requirements for the Business major can be found under the department or program listing in the Programs and Courses section of this catalog.

A major in The School of Business shall consist of not fewer than 36 upper-division units. All courses applied toward the major and preparation for the major must be taken for a letter grade unless otherwise approved by the department chair. A 2.00 GPA in upper-division courses in the major is required for graduation. Once enrolled on this campus, students must complete all courses designated for a major in regular or summer sessions at UCR; exceptions to this policy must be approved by the department chair and by the associate dean.

Candidates for the B.S. degree may not receive more than 108 units of credit toward the degree for work taken in the major discipline (i.e., students must take at least 72 units outside the major discipline).

To receive the bachelor's degree, transfer students must complete a minimum of 16 upper-division units in the major on the Riverside campus.

Students who have been away from the university for several terms should consult with their major departmental advisor about the requirements under which they may graduate. See the Catalog Rights Policy for Undergraduate Degrees in the Policies and Regulations section of this catalog.

College Policies and Procedures

For more information on UCR policies and regulations see the Policies and Regulations section of this catalog.

College Regulations

Refer to The School of Business Web site at business.ucr.edu for more information on college policies and procedures.

Student Responsibility

Students are responsible for meeting deadline dates regarding enrollment, add/drop/withdrawal, change of grading basis, credit by examination, declaration of candidacy, and other actions. The dates are online at registrar.ucr.edu and must be observed. Advising can be obtained in the Undergraduate Business Programs Office, 2340 Olmsted Hall.

Academic Advising

It is the student's responsibility to meet all graduation requirements: general university, college, and major. Pre-Business students are advised in CHASS Student Affairs (see a list of departmental staff for academic affairs at chassstudentaffairs.ucr.edu). As Pre-Business students are accepted in to the Business program, they are advised by academic advisors in the Office of Undergraduate Business Programs (see a list of departmental staff for academic affairs at business.ucr.edu).

Undeclared students are also advised through the Student Academic Affairs Office in CHASS. A staff of academic advisors is readily available to assist with questions pertaining to academic regulations and procedures, selection of courses which satisfy breadth requirements, major options, and alternatives. Students who need to confer with an advisor about overall degree requirements, academic difficulty, program planning, or assistance in selecting a major need to schedule an appointment with their advisor.

Course Enrollment

Students are required to register and enroll by the date set by the campus (visit registrar.ucr.edu for details).

The recommended study load for undergraduate students is 15 to 16 units per quarter. This is the average quarterly load to ensure steady progress for graduation in four years. The minimal program for an undergraduate student to be considered full time is three courses (12 units) per quarter. The normal progress for an undergraduate student is four courses (16 units) per quarter.

A class schedule of fewer than 12 units must be approved by the associate dean (visit registrar.ucr.edu for details on a part-time fee waiver for enrollment in 10 or less units). The college has established enrollment limits beyond which students require academic advisor approval. The limits are as follows: students in good academic standing, 20 units; students on academic notice, 17 units; students on subject-to-dismissal status, 15 units. Students on probation may not take courses on an "S/NC" basis.

After the second week of instruction, students may request changes by petition during a specified period. Petitions must usually be approved by the advisor and also, in the case of adds, by the instructor concerned. Changes to grading basis need advisor approval after the second week of classes. The associate dean must approve any changes in the class schedule requested after the regular petition period.

Courses (including Special Studies courses) can be added through the third week of instruction. Courses dropped after the second week of instruction will appear on the record with a "W" notation, signifying withdrawal. Students can withdraw from courses through the sixth week of instruction. The grading basis for a course can be changed through the eighth week of instruction. After the third week of instruction, a fee is required to file the petition to change the class schedule.

Enrollment on Satisfactory/No Credit Basis

Undergraduate students in good academic standing may receive credit for courses undertaken and graded "S" up to a limit of one-third of the total units undertaken and passed on the Riverside campus at the time the degree is awarded. Normally, this means no more than 4 units of "S/NC" per quarter. The total also includes courses graded only "S/NC." Courses that are required in, or prerequisite to, a major may not be taken on a "S/NC" basis unless approved by the chair of the major department. Students on special status or limited status may take courses on a "S/NC" basis only with the approval of the associate dean.

A student may elect "S/NC" or delete "S/NC" from a course by filing a petition (enrollment adjustment form) with the Registrar. The deadline is the end of the eighth week of instruction and is listed each quarter at registrar.ucr.edu. This deadline is strictly enforced.

Regulations governing the "S/NC" option are described under Credit and Grades in the Policies and Regulations section of this catalog.

Repetition of Courses

See Repetition of Courses in the Policies and Regulations section.

Part-time Study

For details, see Part-Time Study under the Finances and Registration.

Petitions

A petition is a form representing a student's need or desire to be excepted from any standard rule or regulation in the university. It is the only way to obtain formal approval from the department, the college or school, the Registrar, or whomever has authority over a particular request. Some petitions carry a small fee; others are free.

An approved petition for a waiver or substitution in degree requirements represents an agreement between the student, the college or school, and in some cases, the department chair, granting the student an exception from the existing regulations.

Petitions are also used at UCR to change college or major, enroll in fewer units than regulations permit, make late changes to a class schedule, obtain credit by examination, concurrent enrollment, or withdraw from the university. Petitions for most of these exceptions are available in the Office of Undergraduate Business Programs in Olmsted 2340, and Pre-Business and undeclared students can obtain these petitions in the Student Academic Affairs Office in CHASS. Please note that petitions for retroactive actions more than one year old will not be approved.

Credit by Examination

To earn credit for a course by examination without formal enrollment in that course, students must be in residence and in good academic standing.

Before the examination may be given, arrangements and approval for examination for degree credit must be made with the instructor appointed to give the examination, a faculty advisor (if the major department requires it), and the associate dean. Petitions must be filed with the Office of the Registrar no later than the third week of instruction. Credit by examination is not allowed for English Composition courses.

The results of all examinations for degree credit are entered on students' records as though they had actually taken the courses of instruction. The credit by examination procedure may not be used as a means of improving a previous grade.

Undergraduate Credit for Graduate Courses

Students who have a GPA of at least 3.00 in all courses taken in the university or have shown exceptional ability in a special field may take a graduate course for undergraduate credit with the permission of the instructor concerned. Students must have completed at least 18 upper-division quarter units basic to the subject matter of the course.

Expected Progress for Undergraduate Students

At the close of each quarter, the courses, units, grades, and grade points earned are added to the student's cumulative university record. This record summarizes progress toward a degree. Lack of adequate progress may jeopardize continued registration. Students can access their advisory degree check through rweb.ucr.edu.

Applying for Graduation

To graduate from UCR, undergraduate students must file an application for graduation. The application must be submitted by 4 p.m. of the deadline date listed at registrar.ucr.edu. Applications are not accepted after the deadline established for the quarter.

Students should review their remaining requirements through rweb.ucr.edu each quarter. They should also contact their academic advisor two quarters before expected graduation to confirm remaining requirements. Completion of the degree depends upon completion of any work in progress. During the graduation quarter, any changes made to a student's schedule after the third week of instruction should be immediately reported to the academic advisor.

If for any reason a student does not meet the requirements for graduation after filing the application, another application must be filed for the appropriate quarter. Students graduating in absentia (completed all degree work, but did not apply for graduation during their graduating quarter), do not need to apply for readmission and can file an application for

graduation. Students who need to change their major, minor, concentration, or catalog year before applying to graduate, but do not plan to enroll, will utilize the readmission application to request the necessary change prior to filing an application for graduation (fee is waived).

All course work, whether taken at UCR or elsewhere, must be completed by the last day of UCR's finals week during the quarter of graduation (no GDs or Incomplete grades). Incomplete, IE, IP or GD grades on the transcript will stop the processing of the degree.

Once the application for graduation is filed, the student's name will be entered on the appropriate degree list. Students who need to amend the prospective quarter of graduation and who have submitted an application for graduation petition must notify the Undergraduate Business Programs Office, in writing, as soon as possible.

Withdrawals

Students may withdraw from the university prior to the end of instruction, for serious personal reasons, with the approval of the associate dean. Forms are available in the Undergraduate Business Programs Office.



The A. Gary Anderson Graduate School of Management

Master of Business Administration Program
Through The A. Gary Anderson Graduate School of Management, the School of Business offers a professional graduate program leading to the Master of Business Administration (M.B.A.) degree.

The **M.B.A. curriculum** prepares students to excel in a competitive environment marked by unprecedented challenges and technological advances. Communication and computer skills are incorporated into a global approach to both the art and science of management. Most elective courses are seminar size and encourage participative learning. Computers and software are used extensively for teaching and effective management decision making. An internship program assists students in obtaining experience in their professional fields. The mixture of career professionals and recent baccalaureate graduates provides a stimulating and well-rounded classroom environment.

The **M.B.A. curriculum** balances the art and science of management, with a particular emphasis on managing through information, and recognizes the global context of management. The curriculum also emphasizes growing strengths in marketing, accounting, and finance. The first-year core courses of the two-year M.B.A. program provide a strong integrated foundation in the common body of knowledge for management. Thereafter, students take 28 to 36 units of electives offered in various fields, and complete a required internship, capstone course, and a thesis or case analysis.

The **M.Fin. program** addresses the substantial unmet demand for trained finance professionals. The program is best suited for students with a sufficient quantitative background to enable successful completion of the program. The program provides a comprehensive overview of the entire field of finance, with an emphasis on empirical methods and applications. The full-time, one-year program will enable graduates to gain the specialized expertise required for professional advancement, and prepare students who seek to pursue professional certifications in finance.

The **M.P.Ac. program** provides emerging professional accountants and auditors with advanced education in audit and assurance, taxation, accounting information systems and ethics. Accountants and auditors help to ensure that public, private and not for profit entities are run efficiently. Accountants and auditors analyze, verify and communicate financial information for various entities. They may also be involved with budget analysis, tax analysis, management consulting, financial and investment planning, information technology consulting as well as a broad array of assurance services. The M.P.Ac. degree is offered as a one year program (48 units) for graduates with a baccalaureate degree with a concentration or major in accounting. Other students without the equivalent of a baccalaureate degree with a concentration or major in accounting may be admitted to the program with the understanding that additional coursework may be required to earn the M.P.Ac. degree. Candidates will be admitted for the fall quarter only.

The **Master of Science in Business Analytics (MSBA) program** is a rigorous STEM program jointly offered by the School of Business and the Department of Statistics in the College of Agricultural and Natural Sciences. This program helps students gain the crucial skill sets needed to provide critical insights to companies as a business analytics professional. The program is ideally suited for the student who has a strong quantitative aptitude couple with an interest in solving business problems using data analytics. As such, admission is open to students with undergraduate majors from such diverse areas as science, engineering, economics, mathematics, statistics, computer science or a quantitative business discipline such as operations, finance and marketing. The degree requires 48 units of study, which can be done as a full-time three-quarter program or over a longer period on a part-time basis.

The **Ph.D. Program in Business Administration** offers the Doctor of Philosophy Degree (Ph.D.). Concentrations are offered in five major field areas: Accounting; Finance; Marketing; Operations; and Strategic Management and Organizations. The Ph.D. Program in Business Administration trains doctoral students in the design and execution of original research in Management.

The **PROFESSIONAL M.B.A. program** provides an M.B.A. experience tailored according to one's schedule. It allows flexibility and convenience in attaining one of the most sought-after degrees. The PROFESSIONAL M.B.A. is the program of choice for a broad swath of students. Among them might be full-time students who want to earn an M.B.A. on a fast track or who seek to take longer with their studies, international students looking for an M.B.A. at a top university, working professionals seeking a graduate degree without interrupting their careers, or individuals who need to accommodate responsibilities at home and with family as they pursue their academic goals.

Admissions

Admission requirements for the programs are similar to requirements for the Graduate Division. In addition to transcripts, applicants should submit test scores from the Graduate Management Admissions Test (GMAT) or General Record Examination (GRE), and at least one letter of recommendation from persons knowledgeable about the applicant's academic ability and potential for success in the program.

The School of Education

Student Affairs

Graduate Programs
1202 Sproul Hall
(951) 827-4633; fax (951) 827-3942
education.ucr.edu

Teacher Education Programs
1207 Sproul Hall
(951) 827-5225; fax (951) 827-3942
education.ucr.edu

Undergraduate Programs
339 Skye Hall
(951) 827-4633; fax (951) 827-3942
education.ucr.edu

The School

Since its founding in 1969, the School of Education (SOE) at UCR, has consistently delivered cutting edge master's, doctoral and teacher credentialing programs that prepare students to become outstanding classroom educators, researchers, and educational leaders. Our Inland Southern California communities, with their growing population, diversity, and economic disparity, provide excellent opportunities to research important educational problems and develop effective solutions. Our faculty includes scholars in a wide range of areas including autism, learning disability research, education policy, reading development and disabilities, diversity and equity, and assessment and evaluation, and access to higher education.

The School of Education integrates the themes of Learning and Cognition, Social and Cognitive Development within the educational context, Language and Literacy, and Educational Policy. We use these themes to enrich students within a variety of degree programs including the B.A. in Education, Society, and Human Development, the minors in Athletic Leadership and Education, the Teaching Credential, the Master of Arts, the Master of Education, and the Ph.D. in Education, both in and out of the classroom, to enhance the well-being of those who participate in them. The School of Education focuses on the goal of enhancing the learning environments for all within all contexts.

Undergraduate Programs

The School of Education (SOE) offer a B.A. in Education, Society, and Human Development and a Minor in Education. The major builds a theoretical foundation, presents applied understandings in the study of education, and explores the varied contexts of learning over the life course. Program faculty bring multiple disciplinary perspectives to their research and courses, including cognitive sciences, developmental psychology, understanding of the exceptional child, applied behavior analysis, the relationship between education, society and culture, educational policy and leadership, measurement and assessment, and issues in higher education.

Students will benefit from completing the major or a minor because they will be exposed to critical theories that investigate how education has been used to create, maintain, and reinforce social stratification. In addition, students will develop a historical and contemporary awareness of different learning settings, and gain a strong foundation in human development, assessment and interventions in the education context.

Students who are interested in teaching elementary, middle, or high schools should consult an academic advisor in the SOE Undergraduate Programs Office about combining an appropriate major and minor or completing a double major in order to develop appropriate expertise in the subject they plan to teach. The B.A. in Education, Society, and Human Development is not a teacher credential program. (See School of Education section on Teaching Credentials and Masters programs.)

Major

A major is a coordinated group of upper-division courses (courses numbered 100-199) in a field of specialization. The major may be a program of upper-division courses within a single department (departmental major), a group of related courses involving a number of departments (interdisciplinary major), or a group of courses chosen to meet a special interest.

Before enrolling in certain upper-division courses, students may be required to gain appropriate knowledge by completing specific prerequisite courses. With the assistance of a departmental advisor, students are expected to select lower-division courses that prepare them for the advanced studies they propose to follow.

Minor in Education

The School of Education (SOE) offers two minor programs, however no student is required to take a minor. Minors are not degree-granting majors; they are sequences of supplemental courses designed to enhance work in certain areas. Any minor may be taken jointly with any departmental or interdepartmental major. The minor in the School shall consist of not fewer than 16 nor more than 24 units of organized upper-division course work. No overlap may occur among courses used to satisfy upper-division course requirements for a major and a minor. A GPA of at least 2.00 is required in upper-division courses in the field of the minor.

A minor is a set of courses focused on a single discipline or an interdisciplinary thematic area. There can be no substitution for the courses listed as constituting a minor without approval of the governing department or committee. There is no limit on the number of minors a student can declare. Students must declare the minor(s) before their final degree check before graduation by completing a petition with the Student Affairs Office in the College of Humanities, Arts, and Social Sciences, the College of Natural and Agricultural Sciences, the Bourns College of Engineering, the School of Education, School of Business, or the School of Public Policy, depending on their major. Prior approval by the department or committee offering the minor is required. The minor is noted on the transcript at the time the degree is conferred.

Choosing a Major, Undeclared Majors

While first-year students may choose an academic major on entering UCR, those who are unsure about specific academic goals may request to be admitted to CHASS or CNAS as undeclared. These students often take introductory courses in the natural sciences, social sciences, humanities, and fine arts while searching for an area that most excites their interest. Undeclared majors are encouraged to meet with an advisor in the Student Academic Affairs Office in CHASS or CNAS about their selection of courses. Students are encouraged to attend a major change workshop hosted by their college. The School of Education also hosts major change workshops to help you learn about declaring the major in Education, Society, and Human Development. Students with 90 or more units toward a degree must declare a major.

To declare a major, students must obtain approval from the Student Academic Affairs Office by filing a Petition for Declaration of Major. Students who do not declare a major by 90 or more units may have a hold placed on their registration.

Double Majors

Students can declare a second major in a department or program of another college or school. Changes are not permitted while on academic notice or during the final senior year (135 units or more). Both majors must be completed within the maximum limit of 216 units, and approval must be obtained from advisors in both departments or programs. In such cases, all course requirements must be completed for each of the two majors chosen. One of the two majors must be designated as the primary major for the purpose of satisfying breadth or general education requirements. No more than 8 upper-division units may count for both majors simultaneously.

A declaration of two majors in different colleges must be signed by the deans of the colleges concerned and filed by the student with the college of the principal major. If the two majors lead to different degrees (B.S. and B.A.), that fact will be noted on the transcript, but only one diploma indicating both degree designations will be issued upon successful completion of such a program. Furthermore, if the double major is a mixed B.S./B.A., the college requirements for both majors must be met.

Students wishing to declare a second major must present an outline to the SOE Undergraduate Programs Office, indicating which major will be used to satisfy breadth requirements and any overlap courses, if permitted by college and/or school regulations, between the two majors.

Overlap Restrictions

Double Majors: In fulfilling degree requirements for multiple majors, a maximum of 8 units may overlap between two majors if permitted by college and/or school regulations.

Major and Minor Requirements: Students may not receive both the major in Education, Society, and Human Development and a minor in the School of Education. In fulfilling requirements for a minor, a maximum of 8 units may overlap between a major in Education, Society, and Human Development and a minor from another department. No overlap may occur among courses used to satisfy upper-division course requirements for a major and a minor.

Transfer of Majors, Changing Majors

Students in good academic standing can petition to transfer from another college to The School of Education. The petition must be approved by the SOE Undergraduate Programs Office before the change can be processed by the Office of the Registrar. Changes are not permitted while on academic notice or during the final senior year (135 units or more). Detailed requirements can be found under the department or program listing in the Programs and Courses section of this catalog.

University Honors Program

For a description of the University Honors Program, see Educational Opportunities in the front of this catalog. For a listing of requirements and courses, refer to University Honors Program in the Programs and Courses section.)

Degree Requirements

Students in the School of Education must meet three levels of requirements for the Bachelor of Arts degree: general university requirements, college requirements, and major requirements.

If you have questions contact your major department and academic advisor. It is your responsibility to be aware of all University, College, and major graduation requirements and to satisfactorily complete those requirements

Obtaining a Bachelor's Degree

To complete the Bachelor of Arts (B.A.):

- Fulfill General University requirements in Entry Level Writing Requirement and American History and Institutions.
- Complete 180 units (but not exceed 216 units), which 35 of the last 45 must be in residence in the student's college with at least a "C" average (2.0) in overall coursework.
- Fulfill campus-wide English Composition requirement and College of Humanities, Arts, and Social Sciences (CHASS) "breadth requirements" for the B.A. degree.
- Complete the specified requirements in the major, with at least a "C" average (2.00) for upper-division courses in the major discipline.

General University Requirements

General university requirements are listed at the beginning of the Undergraduate Studies section.

Unit Requirements

Students must satisfactorily complete for credit a minimum of 180 units for the bachelor's degree. A maximum of 216 units is allowed. After having credit for 216 units, students are not permitted to continue except in cases approved by the associate dean in which specific academic or professional reasons are involved.

Major Requirements

Detailed requirements for the Education, Society, and Human Development major can be found under the department or program listing in the Programs and Courses section of this catalog.

College Policies and Procedures

For more information on UCR policies and regulations see the Policies and Regulations section of this catalog.

Student Responsibility

Students are responsible for meeting deadline dates regarding enrollment, add/drop/withdrawal, change of grading basis, credit by examination, declaration of candidacy, and other actions. The dates are online at registrar.ucr.edu and must be observed. Advising can be obtained in the SOE Undergraduate Programs Office.

Academic Advising

It is the student's responsibility to meet all graduation requirements: general university, college, and major. A staff of academic advisors is readily available to assist with questions pertaining to academic regulations and procedures, selection of courses which satisfy breadth requirements, major options, and alternatives. Students who need to confer with an advisor about overall degree requirements, academic difficulty, program planning, or assistance in selecting a major need to schedule an appointment with their advisor.

Course Enrollment

Students are required to register and enroll by the date set by the campus visit registrar.ucr.edu for details.

The recommended study load for undergraduate students is 15 to 16 units per quarter. This is the average quarterly load to ensure steady progress for graduation in four years. The minimal program for an undergraduate student to be considered full time is three courses (12 units) per quarter. The normal progress for an undergraduate student is four courses (16 units) per quarter.

A class schedule of fewer than 12 units must be approved by the associate dean (visit registrar.ucr.edu for details). The university has established enrollment limits beyond which students require academic advisor approval. The limits are as follows: students in good academic standing, 20 units; students on academic notice, 17 units; students on subject-to-dismissal status, 15 units. Students on academic notice may not take courses on an "S/ NC" basis.

After the second week of instruction, students may request changes by petition during a specified period. Petitions must usually be approved by the advisor and also, in the case of adds, by the instructor concerned. Changes to grading basis need advisor approval after the second week of classes. The associate dean must approve any changes in the class schedule requested after the regular petition period.

Courses (including Special Studies courses) can be added through the third week of instruction. Courses dropped after the second week of instruction will appear on the record with a "W" notation, signifying withdrawal. Students can withdraw from courses through the sixth week of instruction. The grading basis for a course can be changed through the eighth week of instruction. After the third week of instruction, a fee is required to file the petition to change the class schedule.

Repetition of Courses

See Repetition of Courses in the Policies and Regulations section.

Part-time Study

For details, see Part-Time Study under the Finances and Registration.

Petitions

A petition is a form representing a student's need or desire to be accepted from any standard rule or regulation in the university. It is the only way to obtain formal approval from the department, the college or school, the Registrar, or whomever has authority over a particular request. Some petitions carry a small fee; others are free.

An approved petition for a waiver or substitution in degree requirements represents an agreement between the student, the college or school, and in some cases, the department chair, granting the student an exception from the existing regulations.

Petitions are also used at UCR to change college or major, enroll in fewer units than regulations permit, make late changes to a class schedule, obtain credit by examination, concurrent enrollment, or withdraw from the university. Petitions for most of these exceptions are available on the Undergraduate Education Programs section of the SOE website and in the SOE Undergraduate Programs Office. Please note that petitions for retroactive actions more than one year old will not be approved.

Credit by Examination

To earn credit for a course by examination without formal enrollment in that course, students must be in residence and in good academic standing.

Before the examination may be given, arrangements and approval for examination for degree credit must be made with the instructor appointed to give the examination, a faculty advisor (if the major department requires it), and the associate dean. Petitions must be filed with the Office of the Registrar no later than the third week of instruction. Credit by examination is not allowed for English Composition courses.

The results of all examinations for degree credit are entered on students' records as though they had actually taken the courses of instruction. The credit by examination procedure may not be used as a means of improving a previous grade.

Enrollment on Satisfactory/No Credit Basis

Undergraduate students in good academic standing may receive credit for courses undertaken and graded "S" up to a limit of one-third of the total units undertaken and passed on the Riverside campus at the time the degree is awarded. Normally, this means no more than 4 units of "S/NC" per quarter. The total also includes courses graded only "S/NC." Courses that are required in, or prerequisite to, a major may not be taken on a "S/NC" basis unless approved by the chair of the major department. Students on special status or limited status may take courses on a "S/NC" basis only with the approval of the associate dean.

A student may elect "S/NC" or delete "S/NC" from a course by filing a petition (enrollment adjustment form) with the Registrar. The deadline is the end of the eighth week of instruction and is listed each quarter at registrar.ucr.edu. This deadline is strictly enforced.

Regulations governing the "S/NC" option are described under Credit and Grades in the Policies and Regulations section of this catalog.

Undergraduate Credit for Graduate Courses

Students who have a GPA of at least 3.00 in all courses taken in the university or have shown exceptional ability in a special field may take a graduate course for undergraduate credit with the permission of the instructor concerned and permission of associate dean. Students must have completed at least 18 upper division quarter units basic to the subject matter of the course.

Expected Progress for Undergraduate Students

At the close of each quarter, the courses, units, grades, and grade points earned are added to the student's cumulative university record. This record summarizes progress toward a degree. Lack of adequate progress may jeopardize continued registration. Students can access their advisory degree check through **rweb.ucr.edu**.

Applying for Graduation

To graduate from UCR, undergraduate students must file an application for graduation. The application must be submitted by 4 p.m. of the deadline date listed at **registrar.ucr.edu**. Applications are not accepted after the deadline established for the quarter.

Students should review their remaining requirements through **rweb.ucr. edu** each quarter. They should also contact their academic advisor two quarters before expected graduation to confirm remaining requirements.

Completion of the degree depends upon completion of any work in progress. During the graduation quarter, any changes made to a student's schedule after the third week of instruction should be immediately reported to the academic advisor.

If for any reason a student does not meet the requirements for graduation after filing the application, another application must be filed for the appropriate quarter. Students graduating in absentia after an absence of one or more quarters must apply for readmission to the university and file an application for graduation.

All course work, whether taken at UCR or elsewhere, must be completed by the last day of UCR's finals week during the quarter of graduation (no GDs or Incomplete grades). Incomplete, IE, IP or GD grades on the transcript will stop the processing of the degree.

Once the application for graduation is filed, the student's name will be entered on the appropriate degree list. Students who need to amend the prospective quarter of graduation and who have submitted an application for graduation petition must notify the SOE Undergraduate Education Programs Office, in writing, as soon as possible.

Withdrawals

Students may withdraw from the university prior to the end of instruction, for serious personal reasons, with the approval of the associate dean. Forms are available in the SOE Undergraduate Education Programs Office.

Graduate Degrees and Credentials

The School of Education (SOE) offers credential programs for students preparing for careers in elementary, middle school, and high school teaching; and teaching in classrooms for individuals with mild/moderate and moderate/severe needs. The programs prepare students to teach English learners and students from diverse backgrounds.

The School offers a Master of Education (M.Ed.) degree with a General Education Teaching Concentration. This is for qualified students earning a Multiple Subject or Single Subject credential and is generally completed in one academic year and a summer term. A combined M.Ed. and credential in the area of Special Education is also available to qualified candidates. In addition, M.Ed. Concentrations in Race and Educational Justice; Education Policy Analysis and Leadership; Higher Education Administration and Policy; and STEM Education and Equity are also offered. The school also offers M.A. programs in Education, Society, and Culture; Educational Psychology; Neuroscience and Education; Research Evaluation, Measurement and Statistics (REMS); Special Education and Autism; and STEM Education and Equity. Ph.D. programs in Education, Society and Culture; Education Policy Analysis and Leadership; Educational Psychology; Higher Education Administration and Policy (M.Ed. and Ph.D.); School Psychology and Special Education. The M.A. in School Psychology may be awarded only to students matriculating in the School of Education Ph.D. program. The Ph.D. in School Psychology is offered in combination with a Pupil Personnel Services Credential for School Psychology.

Graduate Study

Curricula are offered through the School of Education for the M.A., M.Ed. and Ph.D. degrees. These programs require broad training in education and in a cognate field of study. Further information can be found under the School of Education in the Programs and Courses section of this catalog or visit **education.ucr.edu**.

Teaching Credential Programs

Students planning to become teachers can pursue the following teaching credential programs in SOE:

1. **Multiple Subject (elementary school)**, in addition, students may add:
   - **Bilingual emphasis in Spanish**. Please see the Teacher Education section of the SOE website at education.ucr.edu to learn about the pathways to complete the Bilingual Authorization.
2. **Single Subject (specified subject(s)** at the middle school and high school level).
3. **Education Specialist (special education)** in the following specializations:
   - **Mild/Moderate Support Needs:** authorizes service for mild to moderatemental retardation; attention deficit and attention deficit hyperactivity disorders; serious emotional disturbance; and includes specific learning disabilities.
   - **Moderate/Severe Support Needs:** authorizes autism, deaf-blindness, moderate to severe mental retardation, multiple disabilities, and serious emotional disturbance.

Admission

Admission to Teacher Education Programs is required in order to complete the professional and graduate level courses. The admission requirements vary depending on the credential specialization but at minimum students need a 3.0 GPA (calculated on the last two years of undergraduate studies), passage of the basic skills requirement, and subject matter competency. Students who want to be considered for an intern program or the M.Ed. General Education Teaching Concentration have additional requirements. More information is available at **education.ucr.edu**.

Licensure and Certification Disclosure

Notice to Students re: Professional Licensure and Certification at **https://www.ucop.edu/institutional-research-academic-planning/content-analysis/academic-planning/licensure-and-certification-disclosures.html**

California Teach-Science and Mathematics Initiative (CalTeach-SMI)

California Teach-Science and Mathematics Initiative (CalTeach-SMI) has a goal of addressing the critical need for highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics. CalTeach-SMI at UCR offers undergraduate students paid/unpaid opportunities to explore STEM teaching as a career option. Through CalTeach-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The CalTeach-SMI Resource Center provides future STEM teachers with material and financial resources to promote planning and professional development towards a science/mathematics education career.

For more information about the CalTeach-SMI program, please visit **smi.ucr.edu**, the Resource Center at 1114 Pierce Hall, or at **https://www.facebook.com/ScienceMathInitiativeAtUcr** and at **instagram.com/smiatucr/**.

The School of Medicine

Medical Student Affairs
School of Medicine Education Building II
(951) 827-9017; fax: (951) 827-5504
somsa.ucr.edu; **medschool.ucr.edu**

M.S. and Ph.D. Programs in Biomedical Sciences
School of Medicine Education Building I
(951) 827-4540; **biomed.ucr.edu/our-degree-programs**

M.P.H. Program
Department of Social Medicine, Population, and Public Health
School of Medicine Education Building I
smpph.ucr.edu

Mission Statement

The mission of the UCR School of Medicine is to improve the health of the people of California and, especially, to serve Inland Southern California by training a diverse workforce of physicians and by developing innovative research and health care delivery programs that will improve the health of the medically underserved in the region and become models to be emulated throughout the state and nation.

The School

The UCR School of Medicine was created to address the physician workforce needs in Inland Southern California and to improve the health of people living in the region. The school's community-based model provides medical students with clinical experiences in a variety of healthcare settings with diverse patient populations.

The M.D. curriculum's Longitudinal Ambulatory Care Experience program trains physicians who will be more attuned to the needs of increasingly diverse and underserved patient populations, with emphasis on culturally competent medical care. The Thomas Haider Program at the UCR School of Medicine maintains a unique pathway into medical school for UCR students, with up to 24 seats filled by students who attend UCR for at least six consecutive quarters and complete their bachelor's degree at UCR. **somsa.ucr.edu/haider-program**

Together with affiliated medical centers in the community, the school is building a range of residency and fellowship training programs to provide the post-M.D. education required for physicians to become fully independent, licensed and board certified. **gme.ucr.edu**

Graduate Study and Research

The Graduate Program in Biomedical Sciences is an interdisciplinary translational research program that incorporates a medical school curriculum with basic science training. Our students become independent research scientists with skills that allow them to bridge the wide gulfs that exist between clinical medicine and basic science research.

The training leads to a Ph.D., combined M.D./Ph.D., or M.S. degree. Students have the opportunity to work with more than 60 faculty members from across the campus conducting interdisciplinary research at the forefront of more than a dozen different fields, including neuroscience, bioengineering, immunology, and molecular endocrinology. **biomed.ucr.edu/our-degree-programs**

Biomedical sciences faculty in the school have robust research programs in such areas as neurodevelopmental, neuroinflammatory and neurodegenerative disorders, traumatic brain injury, parasitic infections, intestinal bowel disease, metabolic and neuroendocrine control of fertility, tumor cell biology, vaccine development, and immune responses to viral infections. This outstanding base is being expanded with additional faculty in the biomedical sciences and clinical sciences with the goals of establishing new translational/clinical research programs and building research expertise in population-based health outcomes, prevention and wellness, health services and health disparities.

The Master's in Public Health is a two-year degree program administered through the Department of Social Medicine, Population, and Public Health that will train the next generation of public health leaders.

Coursework will include core and elective courses in the public health disciplines of biostatistics, epidemiology, environmental health, health policy and management, and social and behavioral health, as well as practical experience in public health. **smpph.ucr.edu/master-public-health**

The Center for Glial-Neuronal Interactions (CGNI) in UCR's School of Medicine brings together researchers with very diverse expertise to foster innovative and collaborative research on problems of brain and spinal cord health and disease. Together, faculty, fellows, and students seek to define molecular mechanisms required for optimal brain and spinal cord function as well as for prevention and therapeutic intervention of neurodevelopmental, neurologic and neurodegenerative diseases. Ongoing research includes programs on Alzheimer's disease, autism spectrum disorders, cognitive disorders, epilepsy, stroke, glioblastoma, infections of the brain, multiple sclerosis, neuroinflammatory disorders, phantom limb syndrome, substance abuse, and traumatic brain injury. **cgni.ucr.edu**

The Center for Healthy Communities (CHC) aims to use innovative community-based research and to promote the health of communities in Inland Southern California. CHC is building bridges with community groups and interdisciplinary health-field faculty to promote the health of the culturally and economically diverse population surrounding UCR, particularly the medically underserved. **healthycommunities.ucr.edu**

The Center for Molecular and Translational Medicine provides a forum to accelerate and enhance collaboration among faculty whose research is devoted to the translation of basic sciences into potential therapeutics, medical devices or diagnostics. With this initiative, UC Riverside and the School of Medicine commit to devoting resources to assist in the development of novel treatments. The translation of basic laboratory discoveries into potential therapies, however, requires a multitude of efforts and expertise that no individual laboratory or funding source can, in isolation, fulfill. Potentially effective therapeutic strategies often never reach patients due to the lack of proper support necessary to channel basic laboratory pre-clinical studies through the complex and rigorous testing of experimental therapeutics. It is envisioned that the Center would either directly support or catalyze funding initiatives to advance the most promising innovative targeting approaches and agents into early stage clinical experimental therapeutics, therefore actively assisting in the first steps toward their development. **molmed.ucr.edu**

Center for RNA Biology and Medicine
The Center for RNA Biology and Medicine is a research center sponsored by UC Riverside and founded by Professor Sika Zheng of the UCR School of Medicine Division of Biomedical Sciences.

The center cultivates a vibrant, dynamic research environment that amplifies UCR's deep and unique strengths in RNA research, and interfaces scientific discovery with medical and industrial applications. The center lays a fluid, forward-facing pipeline from basic to clinical RNA research at UCR and bolsters UCR's worldwide engagement and visibility.

Key areas of current research include the elucidation of RNA biogenesis, RNA processing and modifications, RNA coding of phenotypic variability, and establishing the role of RNA in disease and the exploration of RNA-based and RNA-targeted therapies. **rna.ucr.edu**

Center for Cannabinoid Research (UCRCCR)
The University of California Riverside Center for Cannabinoid Research (UCRCCR) is comprised of diverse scientists, clinicians, and trainees with common goals of understanding roles for the cannabinoid system in health and disease. **cannabinoid.ucr.edu**



Student Pathway Programs and Advising
The School of Medicine's Pathway Programs provide a continuum of student enrichment and academic support activities for students from the middle school level to postbaccalaureate level. The 10 programs can stand alone or build upon one another throughout their academic career, and assist in recruiting, advising and mentoring these future health professionals. The programs are overseen by or coordinated with the Pathway Programs Office at the UCR School of Medicine. **pathwayprograms.ucr.edu**

The Health Professions Advising Center (HPAC), a unit of Undergraduate Education, is a resource available to all UCR undergraduate students and alumni interested in careers in the health professions, including medicine, dentistry, nursing, optometry, pharmacy, physical therapy, veterinary medicine, and public health. Professional staff and peer mentors are available to guide students in planning pre-health professions coursework, gaining health-related experiences and completing service work. A variety of workshops on such topics as the application process and personal statement writing are also offered. **se.ucr.edu/hpac/overview**

Facilities
In addition to the School of Medicine Research Building and School of Medicine Education Building I and II, the school's faculty, students, and staff carry out their educational, research and administrative functions in the Multidisciplinary Research Building, Webber Hall, Pierce Hall, Orbach Library and in several clinical locations within Riverside and San Bernardino counties.

The School of Public Policy

4133 CHASS Interdisciplinary South
(951) 827-5564;
spp@ucr.edu; **spp.ucr.edu**

Mission Statement
The mission of the UCR School of Public Policy is to evaluate and develop solutions to societal problems and governance challenges to inform public policy through excellence in research, undergraduate and graduate education, and engagement with community members and leaders at the local, national, and international level. Their training will be informed by a diverse, interdisciplinary curriculum that emphasizes evidence-based policy research as well as cross-learning from both international and domestic problem-solving experiences, and a rich internship program that emphasizes experiential learning.

Distinctions
UCR is only the third UC to have a School of Public Policy and the first in the ten-campus UC system to offer an undergraduate degree in public policy. It is also the only major research university in the Inland Southern California region to offer a Master of Public Policy (MPP) program. The UCR School of Public Policy is distinctive in its focus on addressing the big policy challenges facing California and, in particular, the inland region. Our "Solutions for the Region, Solutions for the World" approach places an emphasis on applying policy lessons learnt from other parts of the nation and the world to solving California's problems. The School of Public Policy brings together the national and international strengths of policy faculty from across the disciplines at UCR to create an exceptional educational experience for our students.

Undergraduate Study
The School of Public Policy (SPP) offers a B.A. in Public Policy and a minor in Public Policy. The major provides students with a set of research, analytical, and management skills that are transferable across sectors and across issue areas. Program faculty bring multidisciplinary perspectives to courses offered, including political science, data science, economics, education, sociology, social work, and geography.

Students will benefit from completing the major or minor as coursework exposes students to finding solutions to address different societal issues. In addition, students will learn how policies should be designed and implemented to have the desired impact on individuals and communities, and how those policies should be monitored and evaluated to see if created policies are having the desired impacts.

Major in Public Policy

The public policy major is a coordinated group of lower division (courses numbered 0-99) and upper division (courses numbered 100-199) courses. The major requires students to complete six (6) lower division requirements and thirteen (13) upper division requirements. Students are required to complete a minimum of one (1) quarter participation in a public policy related internship as part of the major curriculum.

Before enrolling in certain upper-division courses, students may be required to gain appropriate knowledge by completing specific prerequisite courses or university placement exams. Additionally, lower division courses titled "PBPL" cannot be used to satisfy breadth requirements.

The most current information pertaining to the public policy major requirements can be found on **sppstudents.ucr.edu/undergraduate-students/degree-requirements#major_and_breadth_requirements**

Minor in Public Policy

The School of Public Policy offers a minor in public policy, however declared public policy major students are not allowed to declare a minor in public policy. A minor in public policy is not a degree-granting major; the minor is a sequence of supplemental coursework designed to enhance work in certain areas. The minor may be taken jointly with any interdepartmental major.

The public policy minor is a coordinated group of lower division (courses numbered 0-99) and upper division (courses numbered 100-199) courses. The minor requires students to complete three (3) lower division requirements and four (4) upper division requirements.

Students can declare a minor in public policy with successful completion of all lower division requirements. A student's primary college can have additional requirements in order to declare a minor in public policy.

The most current information pertaining to the public policy minor requirements can be found on **sppstudents.ucr.edu/undergraduate-students/degree-requirements#minor_requirements**

Double Majors

Students can declare a secondary major in a department or program of another program or school. Changes are not to be made on academic notice or with senior standing (135 units or more). Both majors must be completed with the maximum limit of 216 units, and approval must be obtained from advisors in both departments or programs. In such cases, all course requirements must be completed for each of the two majors chosen . One of the two majors must be designated as the primary major for the purpose of satisfying breadth or general education requirements. No more than eight (8) upper-division units may count for both majors simultaneously.

A declaration of two majors in different colleges must be signed by the deans of the colleges concerned and filed by the student with the college of the principal major. If the two majors lead to different degrees (B.S. and B.A.), that fact will be noted on the transcript, but only one diploma indicating both degree designations will be issued upon successful completion of such a program. Furthermore, if the double major is a mixed B.S./B.A., the college requirements for both majors must be met.

Academic Advising

It is the student's responsibility to meet all graduation requirements: general university, college, and major. A staff of academic advisors is readily available to assist with questions pertaining to academic regulations and procedures, selection of courses which satisfy breadth requirements, major options, and alternatives. Students who need to confer with an advisor about overall degree requirements, academic difficulty, program planning, or assistance in selecting a major need to schedule an appointment with their advisor. Students can schedule appointments on **sppstudents.ucr.edu/undergraduate-students/advising**

Graduate Study

Master of Public Policy (MPP)

The MPP program is a full-time, two-year program designed to train a new generation of forward-thinking public policy leaders equipped to address complex and interrelated challenges.

The program focuses on the intersection of social and environmental policy and will prepare students for various careers in the public, private and non-profit sectors.

To be considered for admission, applicants should have a GPA of 3.0 or higher in their last two years of coursework. Applicants must upload a copy of their unofficial transcripts, a resume, two personal statements, and the contact information for three recommenders.

While there are no required courses to be considered for admission, students are strongly encouraged to have completed a course in Statistics, Economics, and Political Science. For additional information on admission requirements and important dates and deadlines, please visit **mpp.ucr.edu**.

The program is designed around 13 core courses and five (5) elective courses offered in the policy areas addressing health, education, environmental, urban, and social justice.

BA/MPP Program

The BA/MPP program will allow students to obtain both BA and MPP degrees through an integrated, five-year plan of study. This program prepares students for professional careers as well as for pursuing subsequent doctoral degrees in relevant disciplines.

Qualified students will be invited to apply for the program in the spring quarter of their junior year. While completing the curriculum for the Bachelor's degree in their senior year, students in the program will also begin the curriculum for the MPP degree. Students will stay for a fifth year and graduate with both their BA and MPP degrees.

For more information, please email **bamppdegree@ucr.edu**.

MD/MPP Program

Students interested in the concurrent degree program have already been admitted to the School of Medicine (SOM). Students will spend the first three years at the SOM. After admission to the program, students will spend a full academic year at the SPP. After completion of MPP coursework, students will finish their last year of medical school and apply for residency. During the 4th year of medical school (5th and final year of the concurrent degree program), students in the concurrent degree program will work on their health policy capstone project.

For more information, please email **mpp@ucr.edu**.

PROGRAMS AND COURSES

Numbering and Classification

The credit value of each course in quarter units is indicated for each term by a number following the title. The Schedule of Classes, at registrationssb.ucr.edu, published several weeks before each term commences, lists the courses that will actually be offered for that term, along with their class hours and locations.

The class type, such as lecture or laboratory, and number of hours per week are listed in the first line of the description.

The letters "A," "B," "C," and "D" are used with the course numbers to indicate sequential order; they do not necessarily indicate that an earlier quarter in the sequence is a prerequisite to the later quarters; the prerequisites (if any) of a given course are stated in the description of that course. The letter designation "E-Z" immediately following a course number — for example, HIST 191 (E-Z) — indicates different topics offered under a general title; no specific instance of such a course, for example, HIST 191E, HIST 191F, or HIST 191G, may be repeated for credit unless otherwise indicated in the course description. The letters "E" through "Z" have no sequential implications. The letters "H", "L", or "P" immediately following a course number usually have special designations: "H" for an honors course, "L" for a laboratory course (usually in the sciences), and "P" for a proseminar. A grade is assigned by the instructor at the end of each term, and credit is granted for each term, except as otherwise noted. Courses are numbered as follows:

1. **Lower-division:** 001–099; generally recommended for freshmen and sophomores.
2. **Upper-division:** 100–199; normally open only to students who have completed at least one lower-division course in the subject, or six quarters/four semesters of college work. Credit in special studies courses for undergraduates is limited to 5 units per quarter.
3. **Graduate:** 200-299; normally open only to students who have completed at least 18 upper-division quarter units basic to the subject matter of the course.

The admission of undergraduates to graduate courses is limited to upper-division students who have an overall scholarship average not lower than "B"; these limits are imposed by the rules of the Graduate Division. However, graduate courses completed before attaining the baccalaureate will not be accepted in partial fulfillment of requirements for the credential or minimum requirements in the 200 series for the master's degree, except for undergraduate students who have received approval for backdating their graduate status to cover the session during which such courses were taken. See the Backdating Units section under Policies and Regulations.

4. **Professional courses for teaching credential candidates:** 300–399.
5. **Other professional courses:** 400–499.

Cross-listed Courses

Cross-listed courses share equivalent course content but are taught by two or more departments. Cross-listed courses generally share a course number, but each course is tied to a specific subject area and department. While prerequisites, unit coverage, and grading basis are identical for cross-listed courses, it may be preferable for students in certain degree programs to enroll under only one of the available subject areas. See an academic advisor to determine which subject area is most appropriate before enrolling in a cross-listed course.

To determine which courses are cross-listed, see individual course descriptions in this catalog or visit registrationssb.ucr.edu.

UC Extension Courses

Students may earn credit toward bachelor's and master's degrees at the UC through University Extension. Acceptance of such credit is based on requirements of a particular college, division or department. Generally, preference is given to credits from courses numbered 001–099 and 100–199, prefixed by XR, XL, XI, XB, etc., indicating that such courses are intended to replicate regular offerings of a campus of the UC. Also, courses organized by University Extension, numbered 001–099 and 100–199, prefixed only with an X, are acceptable.

Extension credits are treated like transfer units from approved colleges. They apply toward unit requirements for a degree, but they do not count toward the requirements for residence. Resident students in the university must have advance approval from the appropriate dean for enrollment in UC Extension courses.

Credit earned in University Extension courses is not automatically applicable toward requirements for a master's degree or university-recommended teaching credential and is permitted only in unusual circumstances. Students desiring such credit should consult with their graduate advisors and the Graduate Division before undertaking such courses.

Abbreviations

AHS	Art History
ANTH	Anthropology
ARBC	Arabic Language
ARLC	Arabic Literatures and Culture
ART	Art
AST	Asian Studies
BCH	Biochemistry
BIEN	Bioengineering
BIOL	Biology
BLCN	Conservation Biology
BLKS	Black Study
BMSC	Biomedical Sciences
BPHY	Biophysics
BPSC	Botany and Plant Sciences
BSWT	Basic Writing
BUAS	Business Administration Actuarial Science
BSBA	Business Administration Business Analytics
BUS	Business Administration
CAH	Cahuilla
CBNS	Cell Biology and Neuroscience
CEE	Chemical and Environmental Engineering
CEN	Computer Engineering
CHE	Chemical Engineering
CHEM	Chemistry
CHFY	CHASS F1rst Year
CHN	Chinese
CLA	Classical Studies
CMDB	Cell, Molecular, and Developmental Biology
COMP	Comparative (Student-designed)
CPAC	Comparative Ancient Civilizations
CPDS	Data Science, Computational
CPLT	Comparative Literature and Languages
CRWT	Creative Writing
CS	Computer Science and Engineering
DNCE	Dance
DTSC	Data Science (Science Track)
DTSE	Data Science (Engineering Track)
ECON	Economics
EDUC	Education
EE	Electrical Engineering
EEOB	Evolution, Ecology, and Organismal Biology
ENGL	English
ENGR	Engineering
ENSC	Environmental Sciences
ENTM	Entomology
ENTX	Environmental Toxicology
ENVE	Environmental Engineering
ERSC	Earth Sciences
ESHD	Education, Society, and Human Development
ETST	Ethnic Studies
EUR	European Culture
FIL	Filipino
FREN	Languages and Literatures/French
GBST	Global Studies
GCEC	Global Climate and Environmental Change
GDIV	Graduate Division
GEN	Genetics
GEO	Geosciences
GNBT	Genetics and Biotechnology
GSST	Gender and Sexuality Studies
GRK	Greek
HASS	Humanities, Arts, and Social Sciences
HISA	History of the Americas
HISE	History of Europe
HIST	History
HNPG	Honors Program
ITAL	Italian
JPN	Japanese
KOR	Korean
LABR	Labor Studies
LATN	Latin
LBST	Liberal Studies
LGBS	Lesbian, Gay, Bisexual, Intersex, and Transgender Studies
LING	Linguistics
LNCR	Learning Center
LNST	Latin American Studies
LTLG	Literatures and Languages
LWSO	Law and Society
MATH	Mathematics
MCBL	Microbiology
MCS	Media and Cultural Studies
MCSB	Molecular, Cell & Systems Biology
MDCL	Medicine (School of)
ME	Mechanical Engineering
MEIS	Middle East and Islamic Studies
MGT	Management
MHHS	Medical and Health Humanities Studies
MSE	Materials Science and Engineering
MUS	Music
NASC	Natural and Agricultural Sciences
NEM	Nematology
NRSC	Neuroscience
PBHL	Public Health Graduate Program
PBPL	Public Policy
PCST	Peace and Conflicts Studies
PHIL	Philosophy
PHYS	Physics
PLPA	Plant Pathology
PLBL	Plant Biology
PORT	Portuguese
POSC	Political Science
PSYC	Psychology
RLST	Religious Studies
RUSN	Russian Studies
SEAS	Southeast Asian Studies
SEHE	Society, Environment, and Health Equity
SFCS	Speculative Fiction and Cultures of Science
SOC	Sociology
SPN	Spanish
STAT	Statistics
SUST	Sustainability Studies
TFDP	Theatre, Film and Digital Production
UCDC	UC Washington Center (UCDC) Academic Internship Program
UGRD	Undergraduate Education
URST	Urban Studies
VNM	Vietnamese
WRIT	University Writing Program

Actuarial Science

Subject abbreviation: BUAS
The School of Business

Yunzeng Wang, Ph.D., Dean
900 University Ave.
Riverside, CA 92521
(951) 827-2932

Undergraduate Business Programs Office
900 University Ave.
Riverside, CA 92521
(951) 827-4551; fax: (951) 827-5061
business.ucr.edu

Actuarial Science Major

Lower division requirements (12-13 courses [at least 52 units]) Major prerequisites (non-BUS courses may be used to satisfy breadth requirements for the School of Business):

- BUS 010 and BUS 020
- CS 009A
- ECON 002 and ECON 003
- STAT 008 or STAT 010 or ECON 101
- MATH 010A and MATH 010B
- MATH 031
- MATH 046

And at least one sequence from either

- MATH 009A, MATH 009B, and MATH 009C or
- MATH 005B and MATH 005C

College Requirements

College Requirements in Actuarial Science follow the School of Business breadth requirements for Actuarial Science as stated below:

English Composition: 12 units up to ENGL 001C (BUS 100W can be used for ENGL 001C with a grade of C or better)

Humanities: 12 units. One course each from:

A. World History

B. Fine Arts, Literature, Philosophy, or Religious Studies

C. One additional Humanities course

Social Sciences: 8 units. One course each from:

A. Economics or Political Science

B. Anthropology, Psychology, or Sociology

Ethnicity (4 units)*: The 4-unit ethnicity requirement can be applied to either the Humanities or Social Sciences requirement, depending on content*

Natural Sciences and Mathematics: 20 units. One course each from:

A. Biological Science

B. Mathematics

C. Physical Science

Plus, two additional courses from Mathematics, Statistics, or Computer Science

Additional Courses: 12 units from Humanities, Social Sciences, or Natural Sciences and Mathematic

Total Units: 56 plus English Composition

The major requirements for the B.S. in Actuarial Science are as follows:

Upper-division major requirements (19-20 courses [at least 80 units])

BUAS 101, BUS 100W, BUS 125, BUS 126, BUS 130, BUS 131, BUS 133 (or BUS 106 and BUS 132), BUS 134, BUS 136, BUS 137, ECON 104A, ECON 104B, STAT 107, STAT 146, STAT 160A, STAT 160B, STAT 160C *and two of the following:* STAT 161, STAT 167, STAT 170, STAT 171.

Administrative Studies

College of Humanities, Arts, and Social Sciences

Committee in Charge

Jana Grittersova, Chair (Political Science)
Muhamad Ali (Religious Studies)
Matthew Mahutga (Sociology)
Michele Salzman, interim (History)
Yang Xie (Economics)
Jeanette Kohl (Art History)
Daryle Williams, Dean, *ex officio*

Major

B.A. degrees are offered in Art History, Economics, History, Political Science, Religious Studies, and Sociology with Administrative Studies. A B.S. degree is offered in Sociology with Administrative Studies. Specified departmental requirements are listed under respective departmental listings.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

1. All requirements of the College of Humanities, Arts, and Social Sciences
2. Specified requirements of the relevant department, to include at least 36 upper-division units in that discipline

Administrative Studies requirements (37 units)

1. Lower-division courses (17 units)
   a) BUS 010, BUS 020
   b) STAT 008 or equivalent (may be used to satisfy breadth requirements)
   c) CS 008 (may be used to satisfy breadth requirements)
2. Upper-division requirements (20 units)
   a) Two courses (8 units) from the list below:
   (1) ECON 102 or ECON 103 or ECON 104A

or ECON 130 or ECON 162/BUS 162

(2) PSYC 140 or PSYC 142

(3) SOC 150 or SOC 151

(4) POSC 181 or POSC 182E or POSC 182G or POSC 183 or POSC 186

(5) ANTH 127 or ANTH 127S or ANTH 131

These two courses must be outside the discipline of the relevant major and cannot be courses included as part of the three-course Business Administration track or their cross-listed equivalents.

b) A three-course track (12 units) in Business Administration courses, from one of the following:

(1) Organizations (General): BUS 100W, BUS 107, BUS 158/ANTH 105, BUS 176/SOC 176, SOC 150, SOC 151

(2) Human Resources Management/ Labor Relations: BUS 100W, BUS 107, BUS 121, BUS 144, BUS 145, BUS 153/ ECON 153, BUS 155, BUS 156, BUS 157, PSYC 142

(3) Business and Society: BUS 100W, BUS 102, BUS 107, PHIL 116, POSC 182E or POSC 182G,POSC 186

(4) Marketing: BUS 103, and two from BUS 111, BUS112, BUS 113, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119, BUS 124, BUS 126, BUS 151, BUS 152, BUS 159, BUS 164, BUS 182

(5) Managerial Accounting/Taxation: BUS 108, and two from BUS 166, BUS 168A, BUS 168B

(6) Financial Accounting: BUS 108, BUS 165A, BUS 165B, BUS 165C, BUS 167

(7) Finance: BUS 106/ECON 134 and Two from BUS 131, BUS 132, BUS 134, BUS 135, BUS 136, BUS 137, BUS 138, BUS 139, BUS 140E, BUS 141, BUS 147

(8) Management Information Systems: BUS 101, BUS 110, BUS 125, BUS 128, BUS 171, BUS 172, BUS 173, BUS 174, BUS 175, BUS 179

(9) Production Management: BUS 104/STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127



Anthropology

Subject abbreviation: ANTH
College of Humanities, Arts, and Social Sciences

Christina Torres, Ph.D., Chair
ANTH Dept. Office 1334 Watkins Hall
anthropology.ucr.edu

Professors

Derick Fay, Ph.D.
Sang-Hee Lee, Ph.D.
Professor of Graduate Division
Christina Schwenkel, Ph.D.
Travis Stanton, Ph.D.
Christina Torres, Ph.D.
João Vargas, Ph.D.
Kevin Vaughn, Ph.D.

Professors Emeriti

Eugene N. Anderson, Ph.D.
Alan R. Beals, Ph.D.
Scott L. Fedick, Ph.D.
Alan G. Fix, Ph.D.
David B. Kronenfeld, Ph.D.
Yolanda Moses, Ph.D. *Professor of Graduate Division*
Sally Allen Ness, Ph.D.
Martin Orans, Ph.D.
Susan Ossman, Ph.D. *Distinguished Professor*
Thomas C. Patterson, Ph.D.
Anne Sutherland, Ph.D.
Karl Taube, Ph.D. *Distinguished Professor and Professor of Graduate Division*
Carlos G. Vélez-Ibáñez, Ph.D.
Christine Ward Gailey, Ph.D.
Philip J. Wilke, Ph.D.

Associate Professors

Sara K. Becker, Ph.D.
Elizabeth Berger, Ph.D.
Anthony Jerry, Ph.D.
Nawa Sugiyama, Ph.D.
Jennifer Syvertsen, Ph.D., MPH
Kenichiro Tsukamoto, Ph.D.

Assistant Professors

Elena Sesma, Ph.D.

Cecilia Vasquez, Ph.D.

Associate Professor of Teaching

Worku Nida, Ph.D.

Majors

Anthropologists study the way diverse groups of people understand and live in various settings ranging from urban environments to rural villages all over the world. They are interested in such questions as: What does it mean to be human? What activities define the social life of groups and how are they related? How do the members of groups communicate? What is the material evidence for their social and biological history? What are the historical, social, political, economic, and environmental forces that have helped to shape the experiences of particular groups of people, both in the past and in the contemporary world? And, how do human societies change and why? Anthropologists apply this knowledge for the benefit of the peoples whose communities they study.

Anthropology includes four broad subfields:

1. Sociocultural anthropology, the comparative study of communities in their local and global contexts
2. Archaeology, the investigation of past societies through their material and written remains
3. Biological anthropology, which focuses on the evolution of human beings as a species and the interaction of human biological variability with culture
4. Linguistic anthropology, which explores the interconnections of language, culture, thought, and social structure

Career Opportunities

Anthropology prepares students for dealing with the challenges of an increasingly international economy, transnationally connected communities, and multicultural citizenries. Besides helping students hone and refine analytical skills and critical thinking, anthropology helps them recognize the impact of cultural dynamics on interpersonal communication and on the social structures that affect everyone's daily lives. Anthropology majors interested in pursuing graduate studies are excellent candidates for programs in anthropology, business, law, journalism, medicine, social work, urban planning, and almost any other profession that calls for working with people from a variety of backgrounds and in a number of different settings.

The skills and knowledge learned as an undergraduate anthropology major help students understand the connections between people. Anthropology majors who are not planning to pursue graduate or professional studies immediately can forge careers as teachers at the primary and secondary levels; interviewers; recruiters in executive and specialized employment agencies; staff and managers in various local, state, and federal governmental agencies as well as in a variety of national and international non-governmental organizations and community development organizations; archaeological field or laboratory technicians; intercultural communications professionals in hospitals and other organizations; or union organizers.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The Department of Anthropology offers the B.A. and B.S. degrees in Anthropology and the B.A. degree in Anthropology/Law and Society. The B.S. program is intended for those planning professional careers in anthropology or in the related fields mentioned above. The B.A. programs are intended for those desiring a broad liberal arts curriculum.

Anthropology Major

The major requirements for the B.A. and B.S. degrees in Anthropology are as follows:

1. **Lower-division requirements (four courses [at least 16 units])**
   a) ANTH 001, ANTH 001H, or ANTH 001W, ANTH 002, ANTH 005, and ANTH 007 or ANTH 007S with a grade of C- or better in each
2. **Upper-division requirements**
   a) One theoretical/history course ANTH 100 or ANTH 100W.
   b) One methods course; ANTH 165E, ANTH 165F, ANTH 165G, or ANTH 165I
   c). One regional course; ANTH 115E-Z or ANTH 140E-Z
3. **At least 6 courses (24 units) in one area of concentration**
   a) Four field approach to anthropology
      1) At least one upper-division course in each of the subdisciplines of anthropology:
         (a) Archaeology
         (b) Biological anthropology
         (c) Cultural and social anthropology
         (d) Linguistic anthropology
      2) Two courses (at least 8 units) of upper-division Anthropology for the B.A.; three courses (at least 12 units) for the B.S.
   b) Medical Anthropology
      1) At least two upper division courses in two different subdisciplines of anthropology:
         (a) Archaeology
         (b) Biological anthropology
         (c) Cultural and social anthropology
         (d) Linguistic anthropology
      2) At least four upper division courses for a B.A. with a concentration in Medical Anthropology (at least 16 units); five courses (at least 20 units) for the B.S. selected from the following:
         (a) ANTH 144 E-Z courses
         (b) GSST 171
   c) Black and Black Diaspora Studies
      1) At least two upper division courses in two different subdisciplines of anthropology:
         (a) Archaeology
         (b) Biological anthropology
         (c) Cultural and Social anthropology
         (d) Linguistic anthropology
      2) At least four upper division courses in Black and Black Diaspora Studies (at least 16 units); for a B.A. with a concentration in Black and Black Diaspora Studies (at least 16 units); five courses (at least 20 units) for the B.S. selected from the following:
         (a) ANTH 142 E-Z courses
         (b) ANTH 144F, ANTH 144I/SEHE 181, ANTH 144K/SEHE 182, ANTH 144O

d) Archeology

1) At least two upper division courses in two different subdiciplines of anthropology:

(a) Archaeology

(b) Biological anthropology

(c) Cultural and Social anthropology

(d) Linguistic anthropology

2) At least four upper division courses in Archeology (at least 16 units); for a B.A. with a concentration in Archeology (at least 16 units); five courses (at least 20 units) for the B.S. selected from the following:

a) ANTH 104; ANTH 110, ANTH 111, ANTH 112, ANTH 113, ANTH 114A, ANTH 114B, ANTH 114C, ANTH 115 E-Z, ANTH 117; ANTH 118, ANTH 129A, ANTH 129B, ANTH 130; ANTH 135; ANTH 151; ANTH 155, ANTH 165E, ANTH 172, ANTH 173, ANTH 178, ANTH 180; ANTH 184; ANTH 185.

The title of the Anthropology major will be entered on the official degree list and on the official transcript. Diplomas will read "Anthropology" with the individual field of concentration specified where appropriate (Medical Anthropology, Black and Black Diaspora Studies, and Archeology).

Note: Students are strongly urged to take the lower-division requirements in the first two years of university study. Students intending to major in anthropology should work closely with a faculty advisor in planning their programs.

Anthropology/Law and Society Major

The Law and Society major is open to undergraduate students with junior standing who have completed LWSO 100 with a grade of "C" or higher. The major requirements for the B.A. degree in Anthropology/Law and Society are as follows:

1. **Anthropology requirements**

   All requirements for the B.A. in Anthropology. See Anthropology Major above for specific requirements.

2. **Law and Society requirements (36 units)**

   a) PHIL 007 or PHIL 007H

   b) LWSO 100 (with a grade of "C" or better)

   c) One course chosen from POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)

   d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159

   e) Two courses chosen from HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180

   f) LWSO 193, Senior Seminar

Note: For sections 2.d) and 2.e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (Anthropology requirements and Law and Society requirements).

Minor

The Department of Anthropology offers a minor in Anthropology which consists of 24 upper division units. Many upper division anthropology courses have lower division prerequisites. Lower division prerequisites do NOT count towards the 24 unit requirement for the minor.

The courses are to be selected as follows:

1. Two upper-division courses in cultural anthropology from ANTH 103, ANTH 117, ANTH 121, ANTH 122, ANTH 124, ANTH 126, ANTH 127 or ANTH 127S, ANTH 131, ANTH 132, ANTH 133, ANTH 136, ANTH 137, ANTH 139, ANTH 142E, ANTH 142F, ANTH 142I, ANTH 144E, ANTH 144F, ANTH 144G, ANTH 144M, ANTH 145, ANTH 148, ANTH 149/GSST 149, ANTH 163, ANTH 142G/ETST 148/LNST 168, ANTH 170, ANTH 173, ANTH 177, ANTH 179, ANTH 182 (ANTH 001 is the normal lower-division prerequisite for these courses.)
2. Two upper-division courses (8 units) from any ONE of the following subdisciplinary areas: (Both courses MUST be taken in the same subdiscipline)

   a) Archaeology

      (1) Prerequisite: ANTH 005

      (2) Courses: ANTH 110, ANTH 111, ANTH 112, ANTH 113, ANTH 118, ANTH 172, ANTH 178/GSST 178

   b) Physical/Biological Anthropology

      (1) Prerequisite: ANTH 002

      (2) Courses: ANTH 104, ANTH 107, ANTH 144J, ANTH 152, ANTH 153, ANTH 155

   c) Linguistic Anthropology

      (1) Prerequisite: ANTH 003

      (2) Courses: ANTH 120, ANTH 123, ANTH 167/LING 167
3. One upper division course (4 units) pertaining to a geographic area from ANTH 115 (E-Z), ANTH 128, ANTH 136 or ANTH 136S, ANTH 140 (E-Z), ANTH 151, ANTH 157, ANTH 161/LNST 161, ANTH 142G/ETST 148/LNST 168
4. One upper division methodological course (4 units) from ANTH 165E, ANTH 165F, ANTH 165G, ANTH 184, ANTH 185

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Visit the departmental Education Abroad website at **https://anthropology.ucr.edu/education-abroad**. Consult the departmental student affairs officer for assistance.

Graduate Program

The Department of Anthropology offers the M.A., M.S., and Ph.D. degrees in Anthropology.

Doctoral Degree

The graduate program transforms scholars into professional anthropologists who will variously engage in research, teaching, policy-related and/or administrative activities that benefit the people with whom they work. The program focuses on how people living in various settings participate in and adapt to processes of change and transformation, both historically and in the contemporary world. The faculty is committed to an integrated, socially engaged concept of the discipline. The traditional subfields — sociocultural anthropology, biological anthropology, archaeology, and linguistics anthropology — are crosscut by a series of concentrations that constitute areas of strength. The most developed concentrations are (1) the applied anthropology of transnational processes (inequality, migration) and the border and binational communities associated with globalization and the internalization of capital; (2) the archaeology of Mesoamerica; (3) cultural and political ecology; (4) Black and Black Diaspora Studies; and (5) the bioarchaeology and paleoanthropology of Asia and the Americas. The department has close working relationships with other programs on campus.

The department is dedicated to educating the next generation of professional anthropologists. The faculty consists of active research scholars with solid records of publication, conducting original research, obtaining extramural grants, and placing graduate students in regional, national, and international labor markets. Aware of the current structures of employment, faculty prepare students to pursue both academic and nonacademic careers.

Admission

Applicants must supply official transcripts from all institutions attended since high school, three letters of recommendation, a writing sample, and a personal statement specifying why they wish to undertake and complete graduate training at the UCR Department of Anthropology.

Course Requirements

During their first year, students complete the year-long seminar sequence ANTH 200A, ANTH 200B, and ANTH 200C (Core Theory in Anthropology). Students must acquire a basic understanding of three of the four subfields (sociocultural anthropology, biological anthropology, archaeology, and linguistics). To fulfill the breadth requirement, students must take at least one graduate course in each of two subfields outside the student's major focus. All students must complete professional

development training by the end of their 9th quarter. This is fulfilled by taking ANTH 210A and ANTH 210B before taking their Ph.D. Oral Exam.

Language Requirement
Students must demonstrate at least a reading knowledge in one language other than English. In some cases, the student's advisor may require knowledge of a second language. The choice of language(s) and the method of demonstrating competence should be determined in consultation with the student's advisor. All students must file a Statement of Plan to Fulfill the Language Requirement by the end of the second quarter of their first year in residency. This includes students who are fully bilingual or whose primary language is not English. Competency may be demonstrated by the following:

1. Placing higher than level 3 in the Language Placement Examination,
2. Receiving a grade of at least "B" or "S" in a reading skills course or level 3 traditional language course, or
3. Alternative certification

In addition, students who plan to conduct fieldwork in a non-English setting must acquire conversational skills in the appropriate language before commencing fieldwork. Because language acquisition is a slow process, students are encouraged to begin language training early in their graduate program.

Methodological Skills Requirement
Students must demonstrate competency in a qualitative or quantitative methodological skill such as GIS, lithic analysis, statistics, or hieroglyphic analysis. The choice of methodological skill should be determined in consultation with the student's advisor. All students must file a Statement of Plan to Fulfill the Methodological Skills Requirement by the end of the second quarter of their first year in residency.

Master's Examination
Students take the master's examination during the week of spring-quarter examinations of their first year. The examination is based on the material covered in the ANTH 200A, ANTH 200B, and ANTH 200C sequence and is required of all students, including those holding a master's degree from another institution. Depending on the student's performance on the test, the faculty will recommend one of the following:

1. **Pass with Distinction or High Pass**
   Automatic continuation in the Ph.D. program and award of the master's degree under Graduate Division Plan II.
2. **Pass**
   Awarding of the master's degree under Graduate Division Plan II, but a successful retake (Pass with Distinction or High Pass) is required to continue in the Ph.D. program.
3. **Fail**
   Master's degree not awarded, but one retake within six months is allowed for potential awarding of the master's degree under Graduate Division Plan II.

The **Preliminary Research Statement** is designed to present the research orientation for an intended dissertation topic and to explain how the student intends to develop and pursue the area of research. The statement should present a comprehensive plan of study and a timeline covering the remainder of the student's graduate career, and outline intended areas, theories, and methods. It should be considered a precursor to the materials developed later in the research proposal and the written qualifying examination. Designating a dissertation committee is part of completing the statement.

The **Written Qualifying Examination** is a research paper written during a specified two-week period. The examination question is generated by the faculty advisor in consultation with the student and the dissertation committee, and must be approved by the department before the student can begin the examination.

The **Research Proposal** prepares students to undertake dissertation research and provides, in part, the basis for the oral qualifying examination. The length and format of the proposal should be similar to that of a proposal for a major funding agency.

Students must give a **Public Oral Presentation** to the department, at the James Young Colloquium, or at a national or international meeting. This presentation is intended to provide the student with experience in presenting research papers in a public context.

The **Oral Qualifying Examination** involves a demonstration of general competence in anthropology, combined with an extended discussion of the proposed dissertation research (preparation, methodology, significance, etc.).

Once students have satisfactorily fulfilled the courses requirement (including breadth requirement), language requirement, methodological skills requirement, master's examination, preliminary research statement, written qualifying examination, research proposal, public presentation, and oral qualifying examination, they are advanced to candidacy for the Ph.D. and formally begin research for the dissertation.

Dissertation and Final Oral Examination (Dissertation Defense)
After advancement to candidacy, students complete a dissertation representing original research within their field of specialization. Dissertations generally require a year of field research followed by an additional year of data analysis and write-up. After completing the dissertation (or a substantial portion of it), students present an oral, public defense of the dissertation.

Professional Development Requirement
All students must complete professional development training by the end of their 9th quarter. This is fulfilled by taking ANTH 210B before taking their Ph.D. Oral Exam.

Master's Degree

The M.A. degree in Anthropology is normally awarded as part of the Ph.D. program, rather than as a separate degree objective.

Plan II (Comprehensive Examination)
Candidates complete 36 units, of which at least 18 must be 200-series courses and must include the ANTH 200A ANTH 200B, and ANTH 200C sequence, and pass a written comprehensive examination prepared by a departmental committee.

M.A. in Anthropology and Education

The M.A is offered in cooperation with the School of Education; see the listing under Education or inquire at either office for further information.

M.S. Degree

Plan I (Thesis) Candidates must complete 56 units, of which at least 24 must be 200-series courses; courses for the area of specialization as specified by the department; and an acceptable thesis.

Lower-Division Courses

ANTH 001 Cultural Anthropology 4 Lecture, 3 hours; discussion, 1 hour. Explores the basic contributions of anthropology to the understanding of human behavior and culture and the explanation of similarities and differences among human societies. Addresses the relevance of materials drawn from tribal and peasant culture to problems of the modern world. Stresses the application of anthropological methods to research problems. Credit is awarded for one of the following ANTH 001, ANTH 001H, or ANTH 001W.

ANTH 001H Honors Cultural Anthropology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to ANTH 001. Explores the basic contributions of anthropology to the understanding of human behavior and culture and the explanation of similarities and differences among human societies. Addresses the relevance of materials drawn from tribal and peasant culture to problems of the modern world. Stresses the application of anthropological methods to research problems. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ANTH 001 or ANTH 001H or ANTH 001W.

ANTH 001W Cultural Anthropology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in WRIT 040T; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Explores the basic contributions of anthropology to the understanding of human behavior and culture and the explanation of similarities and differences among human societies. Addresses the relevance of materials drawn from tribal and peasant culture to problems of the modern world. Stresses the application of anthropological methods to research problems. Fulfills the third-quarter writing requirement for students who earn

a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to WRIT 030. Credit is awarded for one of the following ANTH 001W, ANTH 001, or ANTH 001H.

ANTH 002 Biological Anthropology 5 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. A survey of past and contemporary human variation and evolution considered from the perspective of the fossil record, inferences from nonhuman primate biology and social behavior, and the forces of evolution.

ANTH 003 World Prehistory 4 Lecture, 3 hours; discussion, 1 hour. Examines the cultural history of humankind, from the beginning of tool-using behavior in the Old World to the rise of complex social and political systems (civilizations) in both the Old and New World.

ANTH 005 Introduction to Archaeology 5 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. A general introduction to the aims and methods of archaeology, in the field and in the laboratory. Briefly surveys world prehistory as revealed by these methods.

ANTH 006 Introduction to World Music 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A survey of people, identity, and music making. Includes listening to music from many cultural contexts. Also covers a variety of scholarly topics in world music. Cross-listed with MUS 006.

ANTH 007 Introduction to Linguistic Anthropology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): none. Introduces linguistic anthropological understanding of how language not only reflects but also refracts and shapes our social, political, cultural, and moral realities, values, and interests. Examines linguistic anthropological theories, ethnographies, and methodologies to explore how, to what extent, and why language is unexpectedly cultural, social, and political. Credit is awarded for one of the following ANTH 007 or ANTH 007S.

AANTH 007S Introduction to Linguistic nthropology 5 Lecture, 3 hours; discussion, 1 hour; research, 3 hours. Prerequisite(s): none. Introduces linguistic anthropological understanding of how language not only reflects but also refracts and shapes our social, political, cultural, and moral realities, values, and interests. Examines linguistic anthropological theories, ethnographies, and methodologies to explore how, to what extent, and why language is unexpectedly cultural, social, and political. Credit is awarded for one of the following ANTH 007S or ANTH 007.

ANTH 010 Mysteries of the Ancient Maya 4 Lecture, 3 hours; research, 3 hours. An introduction to all aspects of the ancient Maya civilization of southern Mexico and Central America. Explores Maya origins, political organization, agriculture, art, religion, architecture, hieroglyphic writing, and the unexplained collapse of the civilization. Credit is awarded for one of the following ANTH 010 or ANTH 010S.

ANTH 010S Mysteries of the Ancient Maya 5 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. An introduction to all aspects of the ancient Maya civilization of southern Mexico and Central America. Explores Maya origins, political organization, agriculture, art, religion, architecture, hieroglyphic writing, and the unexplained collapse of the civilization. Credit is awarded for one of the following ANTH 010S or ANTH 010.

ANTH 012 Great Discoveries in Archaeology 4 Lecture, 3 hours; extra reading and written exercises, 3 hours. Introduces the methods and goals of archaeology through examples of "great discoveries" that have altered our understanding about the past. Explores discoveries from around the world, including such well-known examples as King Tut's tomb, Pompeii, and the lost cities of the ancient Maya. Also covers lesser-known recent finds and the application of modern scientific technologies in archaeology.

ANTH 020 Culture, Health, and Healing 4 Lecture, 3 hours; consultation, 1 hour. Surveys health, disease, curing, and nutrition in a cross-cultural perspective. Covers how different cultural groups consider disease, health maintenance, and healing; how traditional beliefs about health and nutrition arise; and what one can and cannot learn from traditional health-seeking practices. Credit is awarded for one of the following ANTH 020 or ANTH 020S.

ANTH 020S Culture, Health and Healing 4 Lecture, 3 hours; discussion, 1 hour. Surveys health, disease, curing, and nutrition in a cross-cultural perspective. Covers how different cultural groups consider disease, health maintenance, and healing; how traditional beliefs about health and nutrition arise; and what one can and cannot learn from traditional health-seeking practices. Credit is awarded for one of the following ANTH 020S or ANTH 020.

ANTH 027 Art of Pre-Columbian America 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): none. A survey course that provides a background to the ancient art of Mexico, Central America, and the Andean region of western South America. Discusses art of pre-Columbian America according to the three broad cultural regions of Mesoamerica, the lower part of central and northwestern South America, and the Andean area. Cross-listed with AHS 027 and LNST 027.

ANTH 050 Human Evolution 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): none. Explores the evolutionary history of humans as biocultural beings adapting to changing environments. Examines fossils, genetics, and archaeological data.

Upper-Division Courses

ANTH 100 History of Anthropological Theory 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W; or consent of instructor. A survey of the history of theory in anthropology and the development of the discipline. Focuses on useful ideas from these theories and methods anthropologists have developed to study other societies. Credit is awarded for one of the following ANTH 100 or ANTH 100W.

ANTH 100W History of Anthropological Theory 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 1 hour. Prerequisite(s): concurrent enrollment in WRIT 040L; ANTH 001 or ANTH 001H or ANTH 001W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; and consent of instructor. A survey of the history of theory in anthropology and the development of the discipline. Focuses on useful ideas from these theories and methods anthropologists have developed to study other societies. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits as alternatives to WRIT 030. Credit is awarded for one of the following ANTH 100W or ANTH 100.

ANTH 101 Contemporary Anthropological Theory 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 100. Explores the core ideas in modern anthropology about culture and society. Covers basic issues of contemporary theory since the 1980s. Explores the new methodologies and application of theory to ethnography.

ANTH 103 Introduction to Visual Anthropology 4 Seminar, 3 hours; individual study, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W; or consent of instructor. An introduction to the field of visual anthropology. Examines the similarities and differences between ethnographic film, critical studies, and written ethnographies. Explores the politics of representing other cultures visually. Credit is awarded for one of the following ANTH 103 or ANTH 103S.

ANTH 103S Intro to Visual Anthropology 5 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 with a grade of C- or better or ANTH 001H with a grade of B or better or ANTH 001W with a grade of C or better; or consent of instructor. An introduction to the field of visual anthropology. Examines the similarities and differences between ethnographic film, critical studies, and written ethnographies. Explores the politics of representing other cultures visually. Credit is awarded for one of the following ANTH 103S or ANTH 103.

ANTH 104 Bioarchaeology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 002 with a grade of C- or better; or consent of instructor. Introduces the study of bioarchaeology in order to explore human skeletal remains from archaeological settings. Topics include the history and

ethics of studying human remains, mortuary archaeology, methodological shifts in skeletal research, and interpretation of human skeletons using various methods.

ANTH 105 Organizations as Cultural Systems 4 Lecture, 6 hours; extra reading and written exercises, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the role of culture in the formation and management of complex bureaucratic organizations. Covers types of organizations and organizational cultures, the impact of the cultural environment, and problems posed by rapid cultural change. Offered in summer only. Cross-listed with BUS 158.

ANTH 106 Gender and Genocide 4 Lecture, 3 hours; individual study, 2 hours; term paper, 1 hour. Prerequisite(s): one of the following courses: GSST 001, GSST 001H, GSST 001S; or consent of instructor. Examines gendered dimensions of contemporary and historical genocides. Analyzes the ways gender ideologies intersect racialization and ethnic marking. Explores how gender shapes selection, forced labor, torture, and murder. Considers gender ideologies in relation to collective, institutional, and individual responses to genocide and genocidal campaigns. Cross-listed with GSST 125.

ANTH 107 Evolution of the Capacity For Culture 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or ANTH 002 or ANTH 003 or relevant preparation in psychology or biology or consent of instructor. An examination of the evolution of the biological and social capacities that have made culture the central attribute of the human species. Topics include the evolution of human diet, tool-making, the family and kinship, and language.

ANTH 108 Anthropology of Global Media 4 Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the global production, transmission, and consumption of mass media in diverse national and transnational contexts. Includes debates over the power of media; construction of knowledge of others; affective responses to images of violence; practices of self-representation; and the ways in which consumers accept, reject and negotiate media messages.

ANTH 110 Prehistoric Agriculture 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A cross-cultural perspective on prehistoric agriculture as resource management, economic system, and political tool. Archaeological methods and theory of reconstructing agricultural systems and their role in prehistoric societies.

ANTH 111 Peopling of the New World 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Consideration of the archaeological, biological, linguistic, and dating evidence documenting the nature and timing of the earliest occupation of the Western Hemisphere by human populations.

ANTH 112 Settlement Patterns and Locational Analysis 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. An archaeological perspective on spatial behavior from architectural design to regional economic systems. Provides an introduction to a broad range of issues and analytical perspectives with an emphasis on theoretical approaches and case studies.

ANTH 113 Ancient Households and Communities 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W; ANTH 003 or ANTH 005; or consent of instructor. Explores archaeological perspectives on households and communities. Discusses their composition, function, and meaning. Illustrates with specific cases from diverse cultural contexts. Topics include everyday life in ancient households and communities, social and economic reproduction, and long-term stability and change.

ANTH 114A Lithic Technology I 4 Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): ANTH 003 or ANTH 005; or consent of instructor. Introduction to the technology of core-and-flake stone tools. Addresses principles of fracture, quarrying, reduction, heat treatment, core technology, and production and use of flaked stone tools in core-and-flake lithic assemblages. Includes assemblage formation processes and their interpretation.

ANTH 114B Lithic Technology 2 4 Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): ANTH 114A; or consent of instructor. Covers the technology of core-and-blade and ground-stone industries. Addresses percussion- and pressure-blade reduction sequences and strategies. Emphasizes quarrying, initial reduction, core and blade production, and production and use of tools from blades. Includes technology and production of ground-stone tools, quarrying of raw material, and assemblage formation processes and their interpretation.

ANTH 114C Lithic Analysis 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ANTH 114B; or consent of instructor. Covers characterization, analysis, and interpretation of stone tool assemblages with emphasis on debitage.

ANTH 115 (E-Z) Archaeological Interpretations 4 Prerequisite(s): ANTH 003 or ANTH 005. Study of the prehistory of different regions of the world. Emphasis is on the method and theory underlying archaeological investigations of the nature of people and culture and the course of human development.

ANTH 115E North American Prehistory 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. Interpretation of the archaeological record of North America from initial peopling of the continent to the historic period.

ANTH 115M Prehistory of California 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. A survey of prehistoric cultures of California from the earliest settlement to the historic period.

ANTH 115R Archaeology of Eastern Mesoamerica 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. An introduction to Mayan archaeology intended to provide an overview of ancient Maya cultural history from the Formative period to the time of Spanish contact. During the course, particular Maya sites will be described in detail.

ANTH 115S Archaeology of Western Mesoamerica 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. An introduction to the archaeology and culture history in the New World nuclear area of Western Mesoamerica from the occupation of this area before 10,000 years ago to the arrival of Spanish Europeans in A.D. 1519.

ANTH 115T Prehistory of the Southwest 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. A survey of prehistoric cultures of the American Southwest from earliest settlement to the historic period.

ANTH 115U Andean Prehistory 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. A description of Andean culture history, emphasizing Peru, from the earliest documentation of human occupation to the Spanish conquest of the Inca. Topics include origins of food production, early ceremonial architecture, Paracas textiles, the Nasca lines, Moche iconography and ritual, and Inca architecture. Discussion of major sites and their architecture, ceramics, sculpture, and other archaeological remains.

ANTH 115X Ancient Oaxaca 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W; ANTH 003 or ANTH 005; or consent of instructor. Explores current understanding about ancient Zapotec, Mixtec, and neighboring cultures in Oaxaca, Mexico, the location of the earliest Mesoamerican state system and one of its earliest cities.

ANTH 117 Anthropology of Cities 4 Lecture, 3 hours; field, 1 hour; extra reading, 2 hours. Prerequisite(s): upper-division standing or consent of the instructor. Examines theoretical and methodological debates in the anthropological study of cities and urban life. Uses ethnographic case studies in Asia, Africa, and Latin America to explore cultural practices and representations of urban space, and struggles over rights to the city. Topics include urban inequality, ecology, housing, planning, and redevelopment.

ANTH 118 Origins of Cities 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or ANTH 003 or ANTH 005 or consent of instructor. Explores new forms of social, economic, and

political organization that developed with the advent of cities. Examines case studies of the rise of urbanism in both the Old and New Worlds to investigate how and why cities emerged and consolidated.

ANTH 119 The Anthropology of Tourism 4 Lecture, 3 hours; extra reading, 1 hour; field, 1 hour; term paper, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or consent of instructor. Surveys the central problems and issues in the anthropological study of tourism. Main topics include the place of tourism in the global economy, the impact of tourism on cultural identity and culture change, environmental issues in tourism development, and tourism as a form of cross- and multicultural communication. Credit is awarded for only one of ANTH 119 or ANTH 280.

ANTH 120 Language and Culture 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W, LING 020 or ANTH 007 or ANTH 007S; restricted to class level standing of junior, or senior; or consent of instructor. Covers the interrelations among language, culture, and habitual behavior; the classification of languages; and anthropological uses of linguistic evidence.

ANTH 121 Anthropological Theories of the Arts 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or consent of instructor. Covers anthropological theories of the arts emphasizing folk and traditional forms. Features oral and written literature and discusses theories of musical, visual, and other arts.

ANTH 122 Economic Anthropology 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W; or consent of instructor. Examines the social and cultural dimensions of production, exchange, saving, borrowing, and consumption. Topics covered include rationality and economizing, reciprocity, gender and household decision-making, and neoliberalism.

ANTH 123 Linguistic Anthropology 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): LING 020, or consent of the instructor. Course will cover the application of linguistics techniques to studies of other symbolic and social fields, the analysis of semantic systems, and the use of linguistic techniques for prehistory.

ANTH 124 Ritual and Religion 4 Lecture, 3 hours. The elements and forms of religious belief and behavior; functions of ritual in society. Cross-cultural comparisons.

ANTH 125 Kinship and Family Organization 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W. Introduces the study of kinship, marriage, family, and social organization in contemporary cultural anthropology and the history of approaches to these topics. Examines the interplay and tensions between cultural norms and practices and state legal systems.

ANTH 126 Southeast Asian Performance 4 Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the roles and genres of expressive culture in Southeast Asia, including dance, music, theater, film, and digital culture. Performance is discussed as both a time-honored and a contemporary medium for cultural production, from the courts to everyday experience. Cross-listed with AST 123, DNCE 123, MUS 123, and SEAS 123.

ANTH 127 Political Anthropology 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or consent of instructor. Examines different overt and covert means by which power and social differentiation are produced, perpetuated, and challenged in societies across the world. Studies the politics of culture, ethnicity, nationalism, and gender. Credit is awarded for only one of ANTH 127 or ANTH 127S.

ANTH 127S Political Anthropology 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or consent of instructor. Examines different overt and covert means by which power and social differentiation are produced, perpetuated, and challenged in societies across the world. Studies the politics of culture, ethnicity, nationalism, and gender. Credit is awarded for only one of ANTH 127 or ANTH 127S.

ANTH 128 Performing Arts of Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in four major geocultural regions of Asia: Central, East, South, and Southeast. No Western music training is required. Course is repeatable to a maximum of 8 units. Cross-listed with AST 128, DNCE 128, and TFDP 176.

ANTH 129A Introduction to Maya Hieroglyphs 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or ANTH 005 or ANTH 007 or ANTH 007S; or consent of instructor. Introduces the Maya hieroglyphs and critically evaluates its political history. Topics include three Maya calendars, a basic grammar (logographs, syllables, verbs, pronouns), three writing methods (transcriptions, transliteration, and translation), dynastic events, gods, supernaturals, and political interactions. Cross-listed with CPAC 129A, and LNST 129A.

ANTH 129B The Linguistics of Ancient Maya Writing 4 Lecture, 3 hours; extra reading, 2 hours; research, 3 hours; term paper, 1 hour. Prerequisite(s): ANTH 129A; or consent of instructor. Analyzes and critically evaluates the linguistics of Ancient Maya Writing. Topics include grammar (transitive, intransitive, positional, active, passive, mediopassive, antipassive, inchoactive verbs, tense, aspect, transitive perfect, noun, pronoun, morphosyllable, phonology); three writing methods (transcriptions, transliteration, and translation); title and rank; scripts and ideologies; and dynastic interactions. Cross-listed with CPAC 129B, and LNST 129B.

ANTH 130 Ancient Pottery Analysis 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s); ANTH 005 or consent of instructor. An extensive review of the techniques used by archaeologists to study ceramic artifacts, one of the most common archaeological remains found at many Holocene sites throughout the world. Critically explores the use of typology, attribute analysis, experimental archaeology, petrography, source analysis, residue analysis, and ceramic ethnoarchaeology.

ANTH 131 Applied Anthropology 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or consent of instructor. Applies anthropology to current issues such as community development, education, health, public administration, and conflict.

ANTH 132 Cultural Ecology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or consent of instructor. Introduces people's relationships to their total environment. Explores strategies for managing the environment and its resources, the effects of the environment on culture and society, the impact of human management on the ecosystem, and ways in which human groups view their surroundings.

ANTH 133 Anthropology and International Development 4 Lecture, 3 hours; research, 2 hours; written work, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or consent of instructor. Analyzes the concept of development by examining major theories and approaches in the anthropological study of international development. Focuses on the relationship between anthropology and the development industry. Topics include ethical issues in development anthropology, causes of failure and success in development interventions, and transformations in development theory and practice.

ANTH 134 The Will to Adorn Dress and Identity 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores sartorial practices as a means for examining formations of identities and structural inequalities across space and time.

ANTH 135 The Archaeology of African Diaspora History and Culture 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Covers the thematic and methodological approaches associated with the historical archaeology of Africa and the African diaspora.

ANTH 136 Anthropological Perspectives On Gender in Southeast Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or equivalent. Examines the intersections of gender, power, and sexuality in post-colonial Southeast Asia. Revisits early ethnographic claims of gender equality. Addresses current anthropological literature on the effects of colonialism, capitalism, and globalization on gender roles and relations within national and

transnational contexts. Cross-listed with SEAS 136. Credit is awarded for only one of ANTH 136/SEAS 136 or ANTH 136S/SEAS 136S.

ANTH 136S Anthropological Perspectives On Gender in Southeast Asia 5 Lecture, 3 hours; discussion, 1 hour; field, 1 hour; extra reading, 2 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or equivalent. Examines the intersections of gender, power, and sexuality in post-colonial Southeast Asia. Revisits early ethnographic claims of gender equality. Addresses current anthropological literature on the effects of colonialism, capitalism, and globalization on gender roles and relations within national and transnational contexts. Cross-listed with SEAS 136S. Credit is awarded for only one of ANTH 136/SEAS 136 or ANTH 136S/SEAS 136S.

ANTH 137 Anthropology: the American Tradition 4 Lecture, 3 hours; research, 3 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduces the historical development of anthropological thought in the United States as a manifestation of class and state formation. Clarifies various intellectual currents in contemporary anthropology and their relationships to intellectual and social developments in the broader society.

ANTH 139 Change and Development 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or ANTH 003 or ANTH 005; upper-division standing or consent of instructor. Examines alternative theories of society, change, and development, as well as the assumptions and premises on which they are based. Considers how they are used to explain capitalist development, imperialism, colonial encounters, nationalism, decolonization, socialist revolution, modernization, unequal exchange, uneven development, globalization, and postcolonialism.

ANTH 140 (E-Z) Ethnographic Interpretations 4 Prerequisite(s): restricted to class level standing of junior, or senior. Study of peoples and cultures in particular areas of the world. Emphasis is placed on ethnological and theoretical problems as these are revealed in the examination of the history, coherent sociocultural patterns, and ecology of specific aboriginal populations and contemporary groups.

ANTH 140E Ethnology of the Greater Southwest 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the many varied native cultures of the Greater Southwest. Major differences as well as similarities in the forms of language, social organization, religion, and material culture occurring in the Greater Southwest will be defined and described. The peoples of the Greater Southwest are considered, not only in terms of the ethnographic present, but also through a diachronic perspective, from the prehistoric past through the Spanish colonial era to the present.

ANTH 140G Anthropological Perspectives in Africa 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Examines a number of African cultures using anthropological perspectives on subsistence patterns, social organization, and religious systems. Addresses the treatment of these cultures following a brief overview of the geography, history, and linguistic patterns of Africa.

ANTH 140I Cultures of Southeast Asia 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or equivalent. Anthropological interpretations of culture and society in southeast Asia including Indonesia. Topics include prehistory, ethnic groups, social organization and structure, human ecology, and folk and high culture.

ANTH 140P Cultures of the Pacific 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or consent of instructor. Overview of the cultures and contemporary issues facing the people of Melanesia, Micronesia, and Polynesia. Examines the contribution of Oceanic studies to anthropological theories of kinship and exchange, gender, development studies, and indigenous knowledge systems. Emphasizes how Pacific Islanders draw on their cultural heritage in emerging from formal colonialism to establish new island nations.

ANTH 140S The Peoples of Mexico in Historical and Global Perspective 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of the cultures and societies of Mexico in historical and global perspective. Emphasis on agrarian communities and the contributions of Mesoamerican ethnography to general anthropological theory.

ANTH 141W Sociocultural Perspectives On Graduate Education Futures 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 040Y; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; or consent of instructor. Introduces prominent sociocultural anthropological principles and theories underpinning the disparities between undergraduate and graduate diversity within the U.S education system. Also addresses components of graduate education within the UC system. Topics include impostor syndrome, growth mindset, social and cultural capital, intersectionality, and time poverty. Offered Online Only. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to WRIT 030.

ANTH 142 (E-Z) Black and Black Diaspora Studies 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): see individual segments for assigned prerequisites. Segments offer critical anthropological perspectives on anti-blackness including historical political economic perspectives, colonial legacies, institutional and individual racism, racialized health disparities, and social movements.

ANTH 142E Blackness and Mass Incarceration 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduction to the data, policy, political debates, and grassroots initiatives addressing unprecedented current incarceration in the United States. Critically investigates role of race and blackness in incarceration trends, new trends in policy, and alternatives to incarceration.

ANTH 142F Black Business Cultures and Identities 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W; or consent of instructor. Examines major debates, methods, and theories in studies of entrepreneurship and the commodification of (ethnic) cultures in transnational and cross-cultural contexts. Critically investigates how identity shapes and is shaped by entrepreneurial success with special attention to the contested and shifting meanings of entrepreneurial success and identity formations.

ANTH 142G Caribbean Culture and Society 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An overview of the Caribbean region from a historical, cultural, and political perspective. Emphasizes contemporary issues affecting the Caribbean and the struggle of its people to maintain their identities. Cross-listed with ETST 148, and LNST 168.

ANTH 142I Afro-American Experience in the U.s. 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W; or consent of instructor. Explores the racial politics of African American cultures and identities in juxtaposition with the making of the American nationhood and global capitalism. Critically examines the various anthropological discourses about African Americanness and portrays African Americans as nation-builders.

ANTH 142J Political Economy of Southern Africa 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W; or consent of instructor. Examines contemporary societies of southern Africa. Focuses on changes and continuities since the end of apartheid. Topics include transformations in ethnic and racial identity and classification; post-apartheid class formation and neoliberalism; labor migration and immigration; HIV/AIDS; land reform, resettlement, and spatial transformation; tourism; and conservation.

ANTH 144 (E-Z) Medical Anthropology Specialization 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): see individual segment for assigned prerequisites; or consent of instructor. Courses related to the cross-cultural study of health and healing including health systems, healthcare, the political, economic, sociocultural, and biological factors that shape human health, and personal experiences of illness.

ANTH 144E Culture and Medicine 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or ANTH 020 or ANTH 020S; restricted to class level standing of junior, or senior; or consent of instructor. Explores the interrelations of health, illness, and culture. Addresses cross-cultural comparisons of health and healing and the effects of cultural systems on health and illness. Examines a diversity of societies and their belief systems and the effects of cultural change (historical and modern) on health and wellbeing.

ANTH 144F Gender, Race, and Medicine 4 Lecture, 3 hours; written work, 1 hour; extra reading, 1 hour; individual study, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores the relationship between Western medicine and women, racial minorities, and non-Western citizens. Investigates how gender ideology, racial inequity, and colonialism shape the medical representation of bodies, sexuality, and pathology. Examines how patients have renegotiated their relationships with medicine through health movements and alternative healing practices. Cross-listed with GSST 185.

ANTH 144G Reproduction: Policies, Politics, and Practices 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines reproductive policies, politics, and practices from a cross-cultural and historical perspective. Discusses political and economic processes and sociocultural dynamics; population control; sex preference; infanticide and neonatal neglect; adoption and foster parenting; abortion; technologically assisted conception; and gestational surrogacy. Cross-listed with GSST 140.

ANTH 144I Anthropology of Human Immunodeficiency Virus (HIV) 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A cross-cultural examination of the global Human Immunodeficiency Virus (HIV) epidemic from an anthropological perspective. Cross-listed with SEHE 181.

ANTH 144J Biological Approaches to Medical Anthropology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 002; or consent of instructor. Introduces medical anthropology from the biological perspective. Explores topics on evolution, health, and medicine; human biological variation in relation to disease; bioarchaeology; and the history of health. Takes the integrative and multidisciplinary approach.

ANTH 144K Drugs and Culture 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A cross-cultural examination of drug use and its relation to race, class, gender, morality, laws, and health policy. Cross-listed with SEHE 182.

ANTH 144M Political Economy of Health 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines critical medical anthropology. Focuses on the linkages between political economy, health, and healthcare systems in modern societies. Considers the effects of poverty, occupation, and environmental transformation in particular social contexts. Reviews four case studies: the political economy of HIV/AIDS, poverty, famine, and nuclear regulation.

ANTH 144N Anthropology of Global Health 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the overlaps, debates, and potential of medical anthropology to address contemporary issues in global health. Focuses on how the historical development, theoretical frameworks, methodological approaches, and ethical debates within medical anthropology can contribute to a just and inclusive version of global health. Cross-listed with SEHE 183.

ANTH 144O Anthropology of Bodies 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores various anthropological discourses about the constitution of bodies focusing on how bodies differ across cultures and historical moments.

ANTH 145 Sexualities and Culture 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one of the following courses: GSST 001, GSST 001H, GSST 001S; or consent of instructor. Examines the field of sexuality studies using a comparative, cross-cultural approach. Emphasizes the relation between culture, history, and political economy in the emergence of sexual practices and sexualized identities. Examines theories of sexuality and identity focusing on violence, human rights, and political agency. Cross-listed with GSST 103.

ANTH 149 Gender, Kinship, and Social Change 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): one of the following courses: GSST 001, GSST 001H, GSST 001S. Examines theories of gender and kinship, the formation of gender hierarchies and their uneven development, and the dynamics of family and gender in stratified social formations. Analyzes the relationship between family forms and political and economic processes. Cross-listed with GSST 149.

ANTH 151 The Art of the Aztec Empire 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 027/ANTH 027/LNST 027 or upper-division standing or consent of instructor. An introduction to the art of the Aztec Empire. Studies architecture, sculpture, ceramics, painting, lapidary work, gold work, and feather work. Explores the relationship between art and ritual and art and the imperial state. Cross-listed with AHS 112 and LNST 112.

ANTH 152 Evolution of the First Hominids 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 002 or consent of instructor. Explores human evolution in the first five million years; examines the fossil record and incorporates data from archaeology and genetics. Topics include hominoid evolution in the Miocene, origin models of the human lineage, and the first ancestral humans.

ANTH 153 Evolution of the Genus Homo 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 002 or consent of instructor. Explores human evolution in the last two million years; examines the fossil record and incorporates data from archaeology and genetics. Topics include origins of genus Homo, world-wide dispersals, Neanderthals, and origins of modern humans.

ANTH 155 Human Osteology 6 Lecture, 2 hours; discussion, 1 hour; laboratory, 6 hours, research, 3 hours. Prerequisite(s): ANTH 002, upper-division standing; or consent of instructor. An in-depth study of the human skeleton, including bone biology, functional morphology, fragment identification, reconstruction, forensic methods, and curation techniques. Useful for anthropologists and those intending careers in medicine, physical therapy, and forensics.

ANTH 157 Visual Culture of the Incas 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the art, architecture, and urban form of the Inca civilization. Examines how these elements influenced state formation, conquest, and resistance. Includes studies of urban plans, buildings, paintings, textiles, prints, sculpture, metalwork, and ceramics. Cross-listed with AHS 117, and LNST 117.

ANTH 161 The Body in Western Art: Antiquity to Present 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; Restricted to major(s) Anthropology, Art History, Art History/Admin Studies, Art History/Religious Studies, Gender and Sexuality Studies, History, History/Administrative Studies, History/Law and Society; or consent of instructor. Presents further questions and study of the human body and how it was depicted and interpreted in works of art from Roman Antiquity to the present. Explores a broad range of artworks in their specific historical, cultural, medical, social, religious, political, and intellectual contexts. Cross-listed with ANTH 161, GSST 130, and HISE 149. Credit is awarded for one of the following AHS 133, ANTH 161, GSST 130, HISE 149, or AHS 016.

ANTH 163 Transnational and Global Communities 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical survey of recent anthropological and related research and theory concerning transnational and global sociocultural processes. Special emphasis on transnational, diasporan, and other unbounded communities; borderlands; and the impact of global media and communication and transnational migration on community and identity.

ANTH 164 Forensic Anthropology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 002 with a grade of C or better; or consent of instructor. Introduces the applied study of forensic anthropology. Topics include basic training in forensic anthropology, its history and theoretical background, medico-legal aspects, case studies, and training in how to identify human skeletal remains and information that can be determined from human bone.

ANTH 165 (E-Z) Anthropological Methods 4 Lecture, 3 hours. Prerequisite(s): ANTH 005. Surveys methods and techniques utilized in archaeology, biological anthropology, cultural anthropology, and linguistic anthropology. Emphasizes field and laboratory methods.

ANTH 165E Methods in Archaeology 4 Lecture, 3 hours, Research, 3 hours, Prerequisite(s): ANTH 005 with a grade of "C-" or better. Review of methods used by archaeologists in field and laboratory contexts. Critically explores the applications of different techniques to answer social questions.

ANTH 165F Methods in Biological Anthropology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 002 or consent of instructor. Introduces research methods in biological anthropology. Topics include the history of scientific approach in American anthropology, statistics, data resampling, evolution, and variation.

ANTH 165G Methods in Cultural Anthropology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 with a grade of C- or better. Introduces research methods used by cultural anthropologists. Examines the research process from identifying research problems, to selecting research methods, developing research strategies, collecting and analyzing data, and reporting research findings. Methods and topics covered include participant observation, writing fieldnotes, interviews and surveys, qualitative and quantitative data analysis, and research ethics. Methods In Cultural Anthropology

ANTH 165I Research Methods of Linguistic Anthropology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 007 or ANTH 007S. Examines research methods of linguistic anthropology, providing students with insights into recording and transcription, participant observation, linguistic biography, and ethnography. Includes a quarter-long ethnographic fieldwork project focused on different methods of data collection and analysis. Investigates several ethnographic accounts of linguistic anthropology including issues of evidence, analysis, and theory generation.

ANTH 167 Structural/Descriptive Linguistics 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): LING 020 or consent of instructor. An overview, from the original sources, of the contribution of major figures and schools in linguistics from Saussure through early Chomsky. Cross-listed with LING 167.

ANTH 169 From the Maghreb to the Middle East 4 Lecture, 3 hours; written work, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or GBST 001 or GBST 002 or consent of instructor. An introduction to the peoples and societies of North Africa and the Middle East. Follows the travels of Ibn Battutah, Ibn Khaldun, and Rafik al Tahtawi. Topics include religion, migration, gender, political organization, the global Middle East, Orientalism, and cultural production. Cross-listed with GBST 169.

ANTH 172 Archaeological Theory 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ANTH 003 or ANTH 005; or consent of instructor. An overview of archaeological theory and the critical evaluation of conceptual approaches to archaeological data. Topics include both archaeological and social theories.

ANTH 173 Social Meanings of Space 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the range of meanings attached to spaces and places, from small-scale expressions such as houses to larger ones such as cities and landscapes. Explores how spaces can reflect and foster social conflict or social unity. Through a study of diverse cultural traditions, considers both the architecture and occupied but "unbuilt" spaces in ancient and current societies.

ANTH 176 Music Cultures of Southeast Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in the Philippines, Indonesia, Malaysia, Thailand, Myanmar (Burma), Laos, Cambodia, and Vietnam. Designed for the student interested in the performing arts and cultures of mainland and insular Southeast Asia. No Western music background is required. Cross-listed with AST 127, DNCE 127, ETST 172, MUS 127, and SEAS 127.

ANTH 177 Gender, Sexuality, and Music in Cross-Cultural Perspectives 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An overview of gendered performance genres from a number of cultures. Explores gender-specific music and notions of gender that are often constructed, maintained, transmitted, and transformed through music and performance. Cross-listed with GSST 126, and MUS 126.

ANTH 178 Gender and Archaeology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): one of the following courses: ANTH 001, ANTH 001H, ANTH 001W, ANTH 005, GSST 001, GSST 001H, GSST 001S; or consent of instructor. Considers gender roles in ancient and historically recent human societies, as well as how gender has shaped archaeological investigation. Cross-listed with GSST 178.

ANTH 179 Gender, War, and Militarism 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines politics of militarization in relation to gender, race, and sexuality in national and international contexts of war. Explores ideologies and representations of masculinity and femininity in discourses of militarism. Topics include war crimes; contestations over historical memory; effects of militarization on gender roles; cults of heroism; and peace activism.

ANTH 180 Material Culture 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or ANTH 005; or consent of instructor. Introduces theoretical and methodological debates in the anthropological study of material culture. Compares archaeological and sociocultural approaches to understanding the significance of matter and materiality across time and space. Covers the relationships between people and things, and the role of objects in social, economic, religious, and political life.

ANTH 182 Anthropology of Human Rights 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines debates in the study of human rights and social injustice. Uses case studies in Asia, Africa, and Latin America to explore legal, cultural, and political practices and representations of rights and reconciliation in postconflict settings. Includes globalization of rights; cultural relativism; indigenous rights movements; advocacy; and gender and health rights.

ANTH 183 Professionalism in Anthropology 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): ANTH 100 or ANTH 100W; or consent of instructor. Covers many aspects of professional career development in anthropology including archaeology. Topics include establishing career goals, building a professional reputation, presenting papers at meetings, submitting manuscripts for publication, applying to graduate school, identifying sources of research funding, and creating a curriculum vitae.

ANTH 184 Field Course in Anthropology 4 to 16 Field, 12 to 48 hours. Prerequisite(s): upper-division standing or consent of the instructor. Study with a qualified professional at selected research sites with on-site supervision. Normally, 16 units will be assigned only when the student is engaged in full-time research at a site distant from UC Riverside. Course may be repeated for credit for up to three quarters with consent of the instructor and approval of a research plan by the department chair.

ANTH 185 Field Course in Archaeology: Survey and Documentation 4 Lecture, 1 hour; discussion, 1 hour; field, 6 hours. Prerequisite(s): ANTH 003 or ANTH 005; upper-division standing; consent of instructor. Trains students in field surveying and documenting historic and aboriginal archaeological sites. Covers satellite-assisted electronic location, cadastral survey location, Universal Transverse Mercator grid coordinates, field

mapping, recording environmental parameters, characterizing assemblage, assessing significance, and using archaeological information centers.

ANTH 186 War and Violence in the Ancient World 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 005. Cross-cultural study of social contexts of warfare and interpersonal violence among ancient peoples. Critically explores the definitions associated with different forms of violence and the methodological, theoretical, and interpretational implications for archaeologists studying warfare across the globe.

ANTH 188 Islam, Women, and the State 4 Lecture, 3 hours; individual study, 2 hours; extra reading, 1 hour. Prerequisite(s): GSST 001 or GSST 001S or GSST 001H or ANTH 001 or ANTH 001W or ANTH 001H; restricted to class level standing of junior, or senior; or consent of instructor. Examines the links between women, Islamic practices, and the politics of state formation and nation building. Explores ways women constitute the terrain of struggle between the traditional and modern, colonialism and nationalism, and religion and politics. Cross-listed with GSST 151.

ANTH 189 Gender and Power in Muslim Societies 4 Lecture, 3 hours; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the dynamics of gender relations within the context of the Muslim world. Analyzes processes of power which influence concepts of femininity, masculinity, the body, and sexuality. Explores heterogeneity of the Muslim world as well as its unifying cultural and social history. Cross-listed with GSST 168.

ANTH 190 Special Studies 1 to 5 variable hours. Prerequisite(s): consent of instructor. Independent study and research by qualified undergraduate students under supervision of a particular faculty member. With consent of instructor, may be repeated without duplication of credit.

ANTH 191 Seminar in Anthropology 4 Seminar, 3 hours, research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines contemporary issues and topics in anthropology that are not part of the regular curricular offerings. Content of the course varies and is announced as the course is offered. Course is repeatable to a maximum of 16 units.

ANTH 195A Senior Thesis 4 Optional for anthropology majors; open to senior students having a "B" average in their major, with consent of instructor. Graded In Progress (IP) until ANTH 195A, ANTH 195B, and ANTH 195C are completed, at which time a final grade is assigned.

ANTH 195B Senior Thesis 4 Optional for anthropology majors; open to senior students having a "B" average in their major, with consent of instructor. Graded In Progress (IP) until ANTH 195A, ANTH 195B, and ANTH 195C are completed, at which time a final grade is assigned.

ANTH 195C Senior Thesis 4 Optional for anthropology majors; open to senior students having a "B" average in their major, with consent of instructor.

ANTH 198I Internship in Anthropology 1 to 12 Field Research, 1 hour to 16 hours. Prerequisite(s): consent of instructor. Systematic participation by an individual in studies associated with future career(s) development within the context of an anthropological research project directed by a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units towards graduation.

ANTH 199H Senior Honors Research 1 to 5 Research, variable hours. Independent work under the direction of members of the staff. With consent of instructor, may be repeated without duplication of credit.

Graduate Courses

ANTH 200A Core Theory in Anthropology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing in Anthropology or consent of instructor. Examines the foundational theories of anthropology and how these inform current discussions about human origins, the origins of human society, divergences in different national traditions, including debates and congruencies with other disciplines.

ANTH 200B Core Theory in Anthropology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing, ANTH 200A; or consent of instructor. Examines the foundational theories of anthropology and how these inform current discussions about diversity; inequality; language; power; knowledge systems; and their intersections in the four subfields.

ANTH 200C Core Theory in Anthropology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): ANTH 200B; graduate standing; or consent of instructor. Examines the foundational theories of anthropology and how these inform current discussions about history, capitalism, diversity, anti-blackness, feminist anthropology, and globalization.

ANTH 201 Critical Theories of Gender, Race, and Blackness 4 Lecture, 3 hours; individual study, 4 hours, written work, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces major critical theories on the intersections of gender, race, and blackness. Topics include the afterlives of slavery, black feminisms, colonialism, empire, genocide, and revolt. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor

ANTH 202 Topics in Southeast Asian Studies 4 Seminar, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An introduction to the world of Southeast Asia and the scholarly discussions about it, with an emphasis on cultural aspects, embedded in their historical context. Materials are in English. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with CPLT 200 and SEAS 200.

ANTH 203 Southeast Asian Cultures 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys ethnographic literature on Southeast Asian cultures, with an emphasis on contemporary research. Covers anthropological approaches to the study of text, ritual, and performance practices; intercultural dynamics; the impact of colonialism and nationalism on traditional cultures; and globalization. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with SEAS 203.

ANTH 204 Anthropology of Identity 4 Seminar, 3 hours; research, 3 hours Prerequisite(s): graduate standing or consent of instructor. Covers cross-cultural study of anthropological discourses about identity formations that are rooted in shifting relations of power and production. Critically examines major debates, methods, and theories in studies of identity. Focuses on the processes and mechanisms through which people craft their individual and collective identities. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ANTH 205 Race and Ethnicity in Mexico 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to history and development of race in Mexico. Examines creation and lasting effects of Casta System. Examines ideologies of Mestizaje and Indigenismo, and changing relationships between indigenous, African descendants, and mestizos in Mexico. Discusses intersections between race, class, and immigration and impacts on national conceptions of race and ethnicity.

ANTH 206 Archaeology of Violence and Conflict 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers the cross-cultural study of social contexts of violence and conflict among ancient peoples. Critically explores the definitions associated with different forms of violence and the methodological, theoretical, and interpretational implications for archaeologists studying warfare across the globe. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ANTH 207 Archaeology of Power and Ideology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 200A, ANTH 200B; graduate standing; or consent of instructor. Critically evaluates social theories that underlay the concepts of power and ideology, and examines archaeological approaches to relevant

questions of social change. Develop student's perspectives on the mechanism of power and ideology beyond Western philosophy. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ANTH 208 Anthropology of the Black Diaspora 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Focuses on intellectual history, analytical perspectives, and political implications of Black diaspora(s). Addresses constitution, viability, and specificities of the multitude of Black experiences through formations of modern subjectivity, society, and empire-state. Theorizes the notion of diaspora in relation to blackness and the Black experience.

ANTH 209 Field Course in Maya Archaeology 4 to 12 Lecture, 2 hours; laboratory, 3 hours to 6 hours; research, 0 to 3 hours; field, 3 to 21 hours. Prerequisite(s): graduate standing and consent of instructor. Archaeological survey and excavation, including training in: site mapping; use of satellite-based Global Positioning Systems; natural resources surveying; and field laboratory techniques. Course is repeatable to a maximum of 36 units with consent of instructor and approval of a research plan by the department chair.

ANTH 210A Description and Inference in Anthropology 4 Seminar, 3 hours; research, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An examination of the modes of defining concepts and relations, developing and framing theories, and relating data to theory in anthropology; analysis of representative attempts to describe and explain behavior; and practice in carrying out simple analyses.

ANTH 210B Professionalism in Anthropology 4 Seminar, 3 hours; research, 1 hour; extra reading, 1 hour; proposal preparation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers many aspects of professional career development in anthropology (including archaeology). Topics include the establishment of career goals, building a professional reputation, presenting papers at meetings, submitting manuscripts for publication, developing a research proposal, identifying sources of research funding, and the job search.

ANTH 211 Afro-Latino(a) Ethnography 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Provides an ethnographic approach to the contemporary experience of blackness in Latin America. Theorizes local intersections of race, gender and sexuality; and the ways local conditions manifest blackness as an ontology within a broader context of production and consumption.

ANTH 217 Matter and Materiality 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Surveys major topics in anthropological research on material culture and relationships between people and things. Compares archaeological and sociocultural approaches to studies of matter and materiality across time and space. Theorizes role and significance of objects in the organization of social, economic, and religious life and maintenance of power structures. May be Taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D. Course is repeatable as content or topic changes to a maximum of 8 units.

ANTH 218 Ancient Maya History and Religion 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Along with describing major historical figures and religious concepts of the ancient Maya, this course describes the analytic approaches used for the study of ancient Maya writing and art. The pioneering work of the nineteenth century as well as the most recent findings in the ongoing process of decipherment and iconographic interpretation will be discussed. Basic background needed to begin original research and interpretation will be provided.

ANTH 220 Theoretical Archaeology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the foundational theories of archaeology, the underlying networks of assumptions, and contemporary theoretical developments in the field.

ANTH 228 Lithic Analysis 4 Seminar, 2 hours; laboratory, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces the method to analyze lithic assemblages. Includes the identification of rocks, stone tool types, waste flakes, different production technologies (direct percussion, indirect percussion, pressure), and typological analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ANTH 251 Theory and Method in Mexican Ethnography 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the basic issues of theory and method in Mexican ethnography. Major streams of thought framing the substance and approaches of rural and urban ethnographies of Mexico are examined.

ANTH 252 Seminar in Archaeology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Studies in culture history and in the data and methods of archaeological research. Course is repeatable.

ANTH 253 Seminar in Physical Anthropology 4 Seminar, 3 hours, research 3 hours. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the analysis of human variation and evolution, the structure of human populations, and the biocultural environments of humans. Course is repeatable.

ANTH 255 Feminism, Gender, and Archaeology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Considers feminist perspectives on past human societies, as well as how feminism and gender have shaped archaeological research design. Examines how gender relates to careers in archaeology.

ANTH 256 Seminar in Cultural Anthropology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides focused coverage of concepts, theory, and methods central to various subfields in cultural anthropology. Course is repeatable.

ANTH 257 Southeast Asian Religions 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Discusses different and dynamic aspects of religion in various Southeast Asian countries including Indonesia, Malaysia, Thailand, Cambodia, Vietnam, and the Philippines. Explores contextualized readings featuring historical, anthropological, literary, and other disciplinary perspectives on this diverse region. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topic changes to a maximum of 8 units. Cross-listed with RLST 253 and SEAS 202.

ANTH 258 Space and Place in Archaeology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines concepts of space and place in archaeology. Explores how spaces can reflect and foster social conflict or unity through studies of diverse cultural traditions. Considers both the architecture and occupied but unbuilt spaces in ancient and current societies.

ANTH 259 Seminar in Linguistic Anthropology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Studies in the concepts, methods, and data pertinent to linguistic anthropology.

ANTH 260 Ethnographic Field Methods 4 Seminar, 3 hours; field, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces ethnographic field methodologies and research techniques through theoretical and practical application. Examines historical and contemporary models of fieldwork practices and ethics. Topics include fieldwork preparation; participant observation; ethnographic responsibilities; data collection techniques; interviews; gendered dynamics of field research; historical and visual methods; and violence in the field. Course is repeatable.

ANTH 261 Anthropology of the Body 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines cultural anthropology's treatment of the body as both a subject and object of social processes through recent and classic texts. Aims to ground theoretical inquiry in ethnographic and historical materials through the examination of bodies across time and space.

ANTH 262 Seminar in Medical Anthropology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys major topics in medical anthropology. Examines the theoretical and methodological underpinnings of medical anthropology, including the cultural construction of health and disease, the nature of the therapeutic process, and how social structures contribute to inequality and suffering.

ANTH 263 Seminar in Ecological Anthropology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Selected topics in method and theory of ecological anthropology, including ethnobiology, food production and consumption, development issues, views of the environment, and questions about the relationship of humans to their environments.

ANTH 264 Codices of Ancient Mexico 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The major manuscripts of the pre-Hispanic and contact periods of Mesoamerica will be reviewed. Special focus will be on the ancient codices of the Maya, Aztec, Mixtec, and the unprovenienced Borgia Group.

ANTH 265 Seminar On Anthropology of Visual Culture 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Presents a historical and ethnographic overview of the role of visual culture in the production and transmission of scientific and cultural knowledge. Focuses on the politics of representation and the ways in which images have maintained or challenged racial, gender, and global hierarchies and inequalities.

ANTH 266 Seminar On History and Memory 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores how societies remember, forget, and give meaning to the past through diverse forms of expression in national and transnational contexts. Examines contestations over historical representations and narrations, as well as the ways in which history and memory are shaped and contested by competing claims to power, legitimacy, and authenticity.

ANTH 267 Ethnographies of Postsocialism 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores diverse sociocultural, economic and political experiences of socialist-capitalist transformations. Includes late and postsocialist nation states in Eastern Europe and postcolonial Asia, Latin America, and Africa. Examines the revival of socialist political and cultural projects as a response to capitalist globalization and escalating social and economic inequalities.

ANTH 277 Seminar in Political Ecology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An advanced course focusing on the relationship between political economy and human ecology for the analysis of the interaction between people, natural resources, and the environment.

ANTH 278 Seminar in Representation and the Ethnographic Text 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Critically reviews and analyzes ethnographic texts, both traditional and experimental. Examining ethnographies as a form of writing, the seminar explores the larger intellectual, theoretical, and political context in which production of ethnographies occurs.

ANTH 279 Seminar in Political Anthropology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Reviewing different forms of stratification and power in society, this seminar critically reviews and analyzes a broad range of materials, debates, and contemporary trends within political anthropology.

ANTH 280 Seminar in Anthropology of Tourism 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An anthropological study of travel and tourism. Topics include cultural implications for travelers, local people, environment, and economy; historical and social construction of tourist sites; material objects; the culture and performance of tourism; the photographic eye; the tourist encounter; cultural mediation; politics of cultural representation; and commoditization of culture. Credit is awarded for only one of ANTH 119 or ANTH 280.

ANTH 281 Anthropology of Humanitarianism 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines debates in anthropological study of humanitarianism and human rights. Uses case studies in Asia, Africa, and Latin America to explore legal, cultural, and political practices of rights and reconciliation in post-conflict settings. Topics include religious aid, philanthropy, ideas of humanity and personhood, state violence and citizenship. and peacekeeping missions.

ANTH 290 Directed Studies 1 to 6 Independent study by graduate students under supervision of a particular faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ANTH 291 Individual Studies in Coordinated Areas 1 to 6 Prerequisite(s): graduate standing. A program of study designed to advise and assist candidates who are preparing for doctoral examination. The following rules apply: 1) a student may take up to 12 units for the Basic Requirements; 2) a student may take up to 8 units for the Comprehensive Requirements. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ANTH 292 Concurrent Analytical Studies in Anthropology 1 to 4 Each ANTH 292 course will be taken concurrently with some 100-series course, but on an individual basis. It will be devoted to completion of a graduate paper based on research or criticism related to the 100-series course. Faculty guidance and evaluation will be provided throughout the quarter. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable.

ANTH 297 Directed Research 1 to 6 Individual research by graduate students directed by a particular faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ANTH 299 Research For Thesis Or Dissertation 1 to 12 Field training and directed research in preparation for and completion of doctoral dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

ANTH 301 Directed Studies in the Teaching of Anthropology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Discusses bibliography and research and teaching techniques used in the instruction of anthropology. Covers how to lead discussion sections and relate student experience to anthropological problems. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ANTH 302 Teaching Practicum 1 to 4 Prerequisite(s): limited to departmental teaching assistants; graduate standing, ANTH 301, or consent of instructor. Supervised teaching in upper- and lower- division Anthropology courses. Required of all teaching assistants. Fulfills teaching portion of Ph.D. teaching requirement. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

Archive, Museum, Manuscript, and Print Designated Emphasis

College of Humanities, Arts, and Social Sciences

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Heidi Brayman (English)
Heidi Brevik-Zender (French & Comparative Literature)
Thomas Cogswell (History)
Brian Geiger (Center for Bibliographic Studies & Research)
Catherine Gudis (History)
Randolph Head (History)
Robin Katz (UCR Library)
Amy Kenny (English)
Matthew William King (Religion)
Aleca Le Blanc (Art History)
Carla Mazzio (English)
Mark Minch-de Leon (English)
Kristoffer Neville (Art History)
Padma Rangarajan (English)
Dylan Rodriguez (Center for Ideas & Society, Media & Cultural Studies, Black Study)
Fuson Wang (English)
Susan Zieger (English)

Designated Emphasis Requirements

The Designated Emphasis is a 12-unit interdisciplinary graduate course of study, requiring coursework across at least two departments. Two of the three required courses, if otherwise eligible, may count towards the student's Ph.D. requirements.

1. Two (2) courses (8 units) selected from AHS 260, AHS 273, AHS 274, CRWT 186A, CRWT 186B, ENGL 117T, ENGL 120T, ENGL 151T, ENGL 152, ENGL 246, ENGL 250, ENGL 260, ENGL 272, ENGL 273, ENGL 282, FREN 160, HISE 113, HISE 114, HIST 197, HIST 240 (E-Z), HIST 262, HIST 263. Students may ask to count another course with relevant content as approved by the Designated Emphasis Director. Students must select courses from at least two different departments or programs, one of which may be their home department. Undergraduate courses taken to fulfill these requirements must be accompanied by a 2-unit 292 course with extra work mutually agreed upon by professor and student.
2. Significant Research Product: All students must complete a 297 graduate course (4 units) with a AMMP affiliated faculty member that produces an approximately 25-page research paper. This paper will fulfill the research requirement of the DE. Students may ask to write their research project within a graduate seminar, as approved by the Designated Emphasis Director. If they request this option, the seminar in question will replace the required 297 units and cannot be used for PhD units.

All requirements for the Designated Emphasis must be satisfied before a student advances to candidacy in their Ph.D. field; a minimum GPA of 3.0 is required for the award of the Designated Emphasis.

Art

Subject abbreviation: ART
College of Humanities, Arts, and Social Sciences

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Professors

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Professor Emeritus

John M. Divola, M.F.A. *Distinguished Professor*
Uta Barth, M.F.A.
Jill Giegerich, M.F.A.
Jim Isermann, M.F.A.
James S. Strombotne, M.F.A.

Associate Professors

Anna Betbeze, M.F.A.
Lynne Marsh, M.F.A.

Assistant Professors

Fiona Connor

Major

The Department of Art offers a B.A. degree in an interdisciplinary program that emphasizes a critical approach to artistic production. Courses are offered in the following curricular areas: photography, digital art, video, two- and three-dimensional media (painting, drawing, sculpture, installation), and critical theory. The program is designed primarily for students preparing for graduate study and those who plan to continue professionally as artists. The Department of Art does not offer courses in commercial art or in graphic design. The department welcomes the participation of nonmajors and nondegree students.

Admission

Incoming freshmen applicants may declare a major in Art upon the submission of their Undergraduate Admission application. Current UCR non-majors and new incoming transfer students must submit a portfolio electronically, consisting of ten (10) images of your original work and/or three (3) clips of moving images or sound work. Guidelines for the portfolio and a link to the site for submission can be found on the Art Department website at art.ucr.edu/. Students whose portfolios are approved will be admitted to the major. Guidelines for submission are also available from Undergraduate Admissions and from the Department of Art.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The major requirements for the B.A. in Art are as follows:

1. **Lower-division requirements (33-34 units)**
   a) ART 001 or ART 002
   b) ART 003 or ART 010
   c) ART 005
   d) ART 006
   e) Two of the following courses: ART 009, ART 012, ART 065, ART 066, ART 067, or any of ART 001, ART 002, ART 003 and ART 010 not used to fulfill Major Requirements 1.c) or 1.d).
   f) AHS 018
   g) ART 032 (must pass with a C+ or better)
2. **Upper-division requirements (40 units)**
   a) ART 132 (must pass with a C+ or better)
   b) ART 160
   c) ART 180
   d) One of the following Art History courses: AHS 115, AHS 135, AHS 136/MCS 137, AHS 175, AHS 176/MCS 176, AHS 178/URST 178, AHS 179, AHS 180, AHS 181, AHS 182, ART 183, AHS 184/URST 184, AHS 185/URST 185, AHS 186/MCS 186, AHS 187, AHS 188, AHS 189E-Z or any other upper-division Art History course that covers the period 1945 to present
   e) A minimum of 24 additional units of upper-division Art course work

Note: A maximum of 12 upper-division transfer units of established equivalency can be accepted for credit. Equivalent transfer units in lower-division studio art course work and lower- and upper-division Art History course work is also accepted for credit toward the major in the respective lower- or upper-division category.

A minimum of 36 units of Art must be taken in residence (UCR Department of Art) to fulfill this major.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Graduate Program

The Art Department offers the Master of Fine Arts (M.F.A.) degree in Visual Art.

Master of Fine Arts in Visual Art

The program's primary goal is to provide a context for research and production of contemporary art at the highest level. The M.F.A. in Visual Art is interdisciplinary, and students can draw on the resources of other departments on campus, including the UCR/California Museum of Photography.

The core of the M.F.A. program is independent creative work done in consultation with faculty. Creative work can be digital imaging, film or video works, installations, painting, performances, photography, sculpture, or any visual medium.

Admission
Applicants must have a B.A. or B.F.A. degree. They must submit an application including all required support documents, a portfolio of their work, and three letters of recommendation. The GRE is not required. Students without any visual arts background may be required to complete courses in Studio Art and Art History subsequent to admission.

Plan I (Thesis)
The M.F.A. is a Plan I (thesis) master's degree program, requiring 72 units in graduate or approved upper-division undergraduate courses that must be completed with at least a letter grade of "B" or "Satisfactory."

Required courses include 48 units in graduate courses in theory and criticism, as well as individual projects and tutorials:

1. Three courses of ART 285, Graduate Critique
2. ART 230, Contemporary Critical Issues
3. ART 240, Critical Theory
4. ART 299, Research for Thesis
5. One of the following Art History Graduate Seminars (AHS 252, AHS 260, AHS 263, AHS 272, AHS 273, AHS 274, AHS 276, AHS 277, AHS 278, AHS 279, AHS 282, AHS 283, AHS 284, AHS 285, AHS 286, or AHS 287)
6. 20 units of Art 293, Directed Individual Studio Production

Of the remaining 24 units in elective courses, at least one additional course must be in Art History or Media and Cultural Studies, and at least two additional courses must be taken from a department other than art. These courses may be graduate or undergraduate courses.

M.F.A. students receive a degree in Visual Art. The course of field study is not characterized by medium.

All students must undergo an annual review in their first and second year by a departmental graduate studies committee. The committee will review the student's comprehensive record of TA-ships, grades, and overall progress of their research and studio work and make one of the following recommendations: proceed in the program or probationary warning (hold).

Each student will be given a written evaluation letter that elaborate on this assessment and make suggestions for improvement. If the student is given a hold, they must undergo a special review after one quarter in order to review progress in areas of concern where the outcome would be to remove the hold or terminate.

The thesis requirement is met by the student's M.F .A. thesis exhibition, accompanied by a written thesis. A graduate thesis committee reviews the thesis. The committee is composed of four faculty members, at least three from the Department of Art. The fourth faculty member may be from another department at any UC Campus. Persons who are not UC Senate members may be appointed only with the approval of the Graduate Dean. Students will select their committee chairperson by the end of the spring quarter of their second year, and select the remaining committee members by the end of the fall quarter of their third year.

Professional Development Requirement
ART 400, Art Practice Seminar, spring quarter. Students must complete the course a minimum of two times. Units earned through ART 400 do not count towards the 72-unit minimum degree requirement.

Foreign Language Requirement None

Teaching Requirement None; however, students are given opportunities to teach and are encouraged to do so.

Normative Time to Degree Nine quarters

Lower-Division Courses

ART 001 Beginning Drawing and Design 4 Lecture, 2 hours; studio, 4 hours. Introduction to the materials, techniques, structure, and expressive properties of drawing and design. Must attend the first day of class for studio orientation and instruction to avoid being dropped from the class.

ART 002 Beginning Painting and Design 4 Lecture, 2 hours; studio, 4 hours. Introductory course in the media, techniques, structural, and expressive properties of painting and design. Must attend the first day of class for studio orientation and instruction to avoid being dropped from the class.

ART 003 Introduction to Photographic Processes 5 Lecture, 3 hours; studio, 4 hours. Introduction to basic principles of photography as fine art. Addresses a range of technological approaches to digital image capture and printing. Explores historical and contemporary approaches to creating meaningful photographs. Must attend the first day of class; see Schedule Notes for Attendance Policy.

ART 004 Introduction to Moving Images: Film, Video and New Media 5 Lecture, 3 hours; studio 3; hours; screening, 3 hours. Prerequisite(s): none. Explores issues and skills of video/film/media art based in production, history, and theory of the moving image. Introduces basic production, editing concepts and techniques of live-action production, story boards, image editing, and final authoring. Examines the moving image through installation, documentary, experimental film, video art, sound art, and performance. Cross-listed with MCS 004.

ART 005 Beginning Sculpture and Three-Dimensional Design 4 Lecture, 3 hours; studio, 3 hours. An introduction to tools and assembly techniques working with wood, plaster, metal, and found objects. Provides an understanding of 3D qualities including volume, surface, and scale as well as an overview of twentieth-century art movements and contemporary sculpture strategies. See Schedule Notes for Attendance Policy.

ART 006 Introduction to Contemporary Critical Issues in Art 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines basic principles and methodologies of theory as applied to the interpretation and creation of works of art. Includes screenings. Cross-listed with MCS 006.

ART 008 Current Topics in Contemporary Art 4 Lecture, 3 hours; activity, 3 hours. Examines visual arts as contemporary phenomenon. Includes study of recent exhibitions of contemporary art, the way art is culturally distributed, and the ideological and conceptual dialogue surrounding significant contemporary art. Encourages visits to nearby museums and major art galleries.

ART 009 Introductory Web-Based Art: Site Creation and Navigation 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. An introduction to the technology and critical issues of Web-based art. Covers Web-site creation software and conceptual and creative navigation. Emphasis is on contemporary issues of non-object, byte-based art practice.

ART 010 Introduction to Video and Time-Based Experimentation 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): none. Introduction to time-based media including video, sound, performance, and installation as studio art practice. Builds aesthetic, conceptual, and technical skills for the creation of video and time-based works. Addresses work of contemporary artists and issues. Emphasizes experimental practical techniques. Must attend the first day; see Schedule Notes for attendance policy.

ART 012 Art After the Internet: Memetic Images and Vernacular Technology 4 Lecture, 3 hours; discussion, 1 hour. An introduction to the history of art within the context of the Internet and vernacular technology (i.e., smartphones and desktop technologies). Emphasizes critical examination of representations and dissemination. Offered online only.

ART 032 Art Studio One 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): Restricted to major(s) Art (Studio). Introduces art majors to the importance of interdisciplinary work. Includes independent projects, critical analysis in a group critique situation, exhibition preparation, and considerations of presentation of their work through written and spoken language. Prepares art majors for upper division coursework.

ART 065 Introduction to Digital Painting and Drawing: Painting Without A Trace 4 Lecture, 3 hours; laboratory, 3 hours; individual study, 2 hours. An introduction to digitally based painting and drawing. Focuses on use of digital software such as Adobe Photoshop and Illustrator to create paintings without the use of traditional paint. Explores the back and forth relationship this new medium and traditional painting, drawing, and photography in history and practice.

ART 066 Introduction to Three-Dimensional Digital Modeling 4 Lecture, 3 hours; laboratory, 3 hours; individual study, 2 hours. Prerequisite(s): none. Covers basic skills necessary to create three-dimensional digital images and models. Emphasizes techniques

for polygon and curved-surface modeling and photorealistic image creation through material shading, texturing, and lighting. Introduces basic scripting methods to create complex models and images with Autodesk Maya or equivalent.

ART 067 Three-Dimensional Digital Modeling and Animation 4 Lecture, 3 hours; laboratory, 3 hours; individual study, 2 hours. Prerequisite(s): ART 066. Builds advanced skills for three-dimensional modeling. Introduces basic computer animation techniques within framework of existing software. Techniques include rigging skeletons for character models, keyframing, and special effects animation using Autodesk Maya software or equivalent. Teaches proficiency in analogous scripting operations. May be graded with Letter Grade or Satisfactory/No Credit (S/NC); no petition required. Course is repeatable to a maximum of 8 units.

ART 070 (E-Z) Digital Imaging Software For the Visual Arts 4 Lecture, 2 hours; laboratory, 6 hours. Provides training in basic digital image manipulation software skills in preparation for digital image applications across varied media. E. Introduction To Image Manipulation (photoshop); F. Introduction To Video Editing (finalcut Pro, Avid, Media 100); G. Introduction To Web Authoring (dreamweaver, Quicktime); I. Introduction To Graphic Design And Desktop Publishing (quark). Course is repeatable as content or topic changes to a maximum of 8 units.

ART 071 (E-Z) Photographic Materials and Processes 4 Lecture, 2 hours; laboratory, 6 hours. In-depth instruction of conventional (i.e., nondigital) photographic processes. Instruction is primarily technical; involves some discussion of application to contemporary art. F. View Camera Workshop; K. Technical Issues Of Basic Black And White Photography; M. Technical Issues Of Color Photography; N. Intermediate Technical Aspects Of Black And White Photography; O. Intermediate Technical Issues Of Film-based Digital Photography. Course is repeatable as content or topic changes.

ART 075 (E-Z) Sculpture Materials and Processes 2 Laboratory, 3 hours; workshop, 10 hours per quarter. Each topic focuses on a single art-making process. Provides in-depth understanding for the beginning sculpture student and a project-derived technique. E. Metal; F. Mold-making; G. Plaster And Clay; J. Wood. Course is repeatable to a maximum of 8 units.

Upper-Division Courses

ART 102 Intermediate Drawing 4 Lecture, 2, hours; studio, 4 hours. Prerequisite(s): ART 001 and ART 002 or equivalent and consent of instructor. An intermediate course of study. Subject: primarily still life, landscape and non-figurative images. Purpose: a fuller understanding of the technical and expressive aspects of drawing. Studio exercises and in-studio lectures. Course is repeatable to a maximum of 8 units with consent of instructor.

ART 103 Advanced Drawing 4 Lecture, 2, hours; studio, 4 hours. Prerequisite(s): ART 102. Intermediate Drawing, or equivalent and consent of instructor. An advanced course of study in drawing techniques and the employment of the drawing medium as a terminal means of artistic expression. Course is repeatable to a maximum of 12 units.

ART 104 Life Drawing 4 Lecture, 2, hours; studio, 4 hours. Prerequisite(s): ART 001 and ART 002 or equivalent and consent of instructor. Media to be pencil, charcoal, pen and ink. Subject: primarily the figure. Purpose: a fuller understanding of the figure and figure composition. Method combines lectures with exercises in studio and outside assignments. Course is repeatable to a maximum of 12 units.

ART 110 Intermediate Painting 4 Lecture, 2, hours; studio, 4 hours. Prerequisite(s): ART 001 and ART 002 or equivalent and consent of instructor. Subject: primarily still-life, landscape and figure. Purpose: a fuller understanding of the technical aspects of painting. Method: studio exercises, in-studio lectures and outside assignments. Course may be repeated for credit to a total of 12 units.

ART 111 Advanced Painting 4 Lecture, 2, hours; studio, 4 hours. Prerequisite(s): ART 110 and consent of instructor. Advanced problems in figurative and nonfigurative painting. Emphasis on the development of personal direction. Investigation of the individual student's relation to contemporary ideas in painting. In-studio lectures, studio exercises, and outside assignments. May be repeated for credit to a total of 12 units.

ART 112 (E-Z) Painting Materials and Processes 2 Studio, 2 hours; workshop, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Focuses on selected special techniques or approaches to painting. Course is repeatable to a maximum of 12 units.

ART 115 Intermediate Sculpture 4 Lecture, 3 hours; studio 3 hours. Prerequisite(s): ART 005. Develops the necessary critical and imaginative faculties for making sculpture. Through project assignments, students explore associations between materials, forms, and context to construct or deconstruct ideas. Audiovisual presentations, readings, and group critiques survey twentieth-century modern sculpture and more recent practices. Examines the artist's role in the cultural landscape of spectacle and entertainment. Course is repeatable to a maximum of 12 units.

ART 123 Chromalogue 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): ART 001 or ART 002 or ART 003 or ART 005 or ART 010; restricted to class level standing of junior, or senior; restricted to major(s) Art (Studio). Introduces philosophical, theoretical, scientific histories related to the understanding and development (use) of color in aesthetic production alongside material history of chemical industry in the 19th and 20th centuries. Addresses recent discoveries of color and technology. Focuses on color as material and perception. Explores fluidity in meaning, production, and experience.

ART 125 Sculpture Hybrid: Furniture, Architecture, Decoration (fad) 4 Lecture, 3 hours; laboratory, 3 hours; consultation, .5 to 1.5 hours. Prerequisite(s): ART 005, ART 115; or consent of instructor. Introduces the sculptural object that exists as or in relationship to furniture, architecture, and interior decoration. Includes an overview of work that defies classification as art or design such as the Bauhaus movement, through utopian American mid-century design and architecture and Italian-based Memphis design, to contemporary art-making practices. Explores theoretical challenges inherent in this art-making strategy.

ART 131 Intermediate Photography and Digital Technology 4 Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): ART 003 or consent of instructor. Covers the complete cycle of photographic production from scanning to output. Emphasizes developing skill in creating digital photographic imagery for creative and cultural expression. Software and some digital equipment are provided. A 35mm single lens reflex (SLR) or digital cameras and flash drives are required. Course is repeatable to a maximum of 8 units. Cross-listed with MCS 131.

ART 132 Art Studio Two 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): ART 006/MCS 006, ART 032, upper-division standing in Art; or consent of instructor. Prepares junior Art majors for their senior course work. Emphasizes interdisciplinary work, independent projects, critical analysis in a group critique situation, exhibition preparation, and writing a preliminary artist statement. Letter Grade only.

ART 133 Senior Art Workshop 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): upper-division standing in Art, 16 upper-division units in Art course work, or consent of instructor. Prepares senior Art majors for their thesis exhibition show. Emphasizes interdisciplinary work, independent projects, critical analysis in a group critique situation, exhibition preparation, and writing a final thesis statement.

ART 134 Mixed Media 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): ART 001 and ART 002. Exploration into experimental methods for creating an image; techniques of frottage, collage, photo transfer, modeling and mold making, assemblage.

ART 135 Intermedia: Art, Media, and Culture 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of performance, photography, video, film, television, installation, and other related "intermedias." Focuses on intermedial artworks and how they are constructed, documented, analyzed, and viewed in the larger context of culture. Cross-listed with MCS 135.

ART 136 Installation and Site-Specific Art 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): consent of instructor. Focuses on performance, photo installation, computer art, video/film, site-specific installation, sculpture, and/or other intermedia. Concentrates on production and analysis of site-specific art. Course is repeatable to a maximum of 8 units. Cross-listed with MCS 136. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

ART 137 Advanced Sculpture 4 Lecture, 3 hours; studio 3 hours. Prerequisite(s): ART 115. Focuses on self-directed individual sculpture projects. Course is repeatable to a maximum of 12 units.

ART 139 Intermediate Web-Based Art: Animation, Audio, and Interactivity 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ART 009 or consent of instructor. Explores the conceptual and creative possibilities of Web-based animation, audio, and interactive software at the intermediate level. Addresses the complex interconnections and unique quality of Internet-based art.

ART 140 Intermediate Analog Photography 4 Lecture, 3 hours; studio, 4 hours. Prerequisite(s): ART 003 or ART 071K; or consent of instructor. Introduction to analog film processing and black and white printing. Focuses on developing individual creative approaches in analog photography. Some analog film cameras available for rental, or students may provide their own cameras. Course is repeatable to a maximum of 12 units.

ART 143 Advanced Digital Imaging Technology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ART 003, ART 131/MCS 131. Covers advanced digital imaging technologies such as large-format scanning, printing, color correction, retouching, and color management. Emphasizes the development of technical skills.

ART 145 Advanced Photography Workshop 4 Lecture, 3 hours; studio 4 hours. Prerequisite(s): ART 131/MCS 131 or ART 140 or consent of instructor. Advanced individual photographic project based activities. Emphasis on technology, theory, history and process. Critique and lecture. Course is repeatable to a maximum of 12 units.

ART 146 (E-Z) Topics in Advanced Photography 4 Lecture, 2 hours; studio, 4 hours. Prerequisite(s): ART 131 or MCS 131 or ART 140 or ART 145; or consent of instructor. An advanced studio course designed to focus on selected special techniques of or approaches to photography. Subject matter determined by the instructor and may vary. K. Polaroid Photography; L. The Book And The Photograph; M. Dye Transfer; N. Current Art Practices; O. Photography And The Urban Edge; P. Fabricated To Be Photographed And The Directorial Mode; Q. Sycamore Canyon Photographic Project. Course is repeatable as content or topic changes to a maximum of 12 units.

ART 150 Intermediate Moving Images: Film Video and New Media 5 Lecture, 3 hours; studio, 3 hours; screening, 3 hours. Prerequisite(s): ART 004/MCS 004. Examines the moving image through installation, documentary, experimental film, video art, sound art, and performance. Builds upon production and editing concepts introduced in ART 004/MCS 004. Explores issues and skills of video/film/media art based in production, history, and theory of the moving image. Covers editing theory, lighting, and sound editing. Course is repeatable to a maximum of 10 units. Cross-listed with MCS 150.

ART 151 Intermediate Video and Time-Based Experimentation 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): ART 010; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Develops conceptual methods and experimental practical techniques for making video and time-based artworks through assignments and self-directed projects. Includes support of production through critique, discussion, and exposure to contemporary artists and theorists. Explores time-based media's expanding critical role in contemporary art and society. Course is repeatable to a maximum of 8 units.

ART 152 Advanced Video and Time-Based Experimentation 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): ART 151; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Focuses on the production of self-directed individual video and/or time-based projects. Emphasizes contextualization in contemporary art practice, critical analysis in a group critique situation, exhibition and presentation, and writing an artist statement. Course is repeatable to a maximum of 12 units.

ART 155 Advanced Moving Images: Film, Video and New Media 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ART 150/MCS 150. Expands on skills introduced in ART 150/MCS 150. Explores issues and skills connected with video/film/media art based on the production, history, and theory of the moving image. Covers recording, editing theory, lighting, and sound mixing. Examines time-based media through installation, documentary, experimental film, video art, sound art, and performance. Course is repeatable to a maximum of 12 units. Cross-listed with MCS 155.

ART 160 Intermediate Art Theory 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ART 006/MCS 006. Addresses current critical and theoretical issues in modern and contemporary culture. Examines art production in light of contemporary and modernist art practice, theory, and history in relation to the interpretation and creation of art. Focuses on issues of race, gender, politics, aesthetics, class, and sexuality.

ART 161 Special Topics in Art Criticism and Theory 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): MCS 001 with a grade of C- or better or ART 160 with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Advanced topics in contemporary art theory and criticism. Examines the reception, analysis, and theoretical underpinning of works of art in relation to contemporary and historical issues in the visual arts. Course is repeatable to a maximum of 12 units. Cross-listed with MCS 163.

ART 162 Special Topics in New Genres of Art Practice 4 Lecture, 2, hours; studio, 4 hours. Prerequisite(s): ART 006/MCS 006 and a beginning studio art course with grades of "C" or better or consent of instructor. Through group critiques, readings, and discussions, explores art making while introducing significant and recent practices in cultural production. Course is repeatable to a maximum of 12 units.

ART 165 Intermediate Digital Painting and Drawing: Intermediate Painting Without A Trace 4 Lecture, 3 hours; laboratory, 4 hours; individual study, 2 hours. Prerequisite(s): ART 065. Continues the investigation of two-dimensional digitally based painting and drawing. Explores possibilities in combining traditional and digital painting techniques. Examines the relationship between this new medium and traditional painting, drawing., and photography. Course is repeatable to a maximum of 8 units.

ART 167 Intermediate Digital Media: Web Authoring 4 Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): ART 009 or consent of instructor. Examines the histories, myths, and technical particularities of the Web from the artist's perspective. Includes art projects that are site-specific to the Internet. Explores issues including access, interface design, activism, multiple narratives, programming, and code. Does not cover software training or commercial graphic design.

ART 168 Intermediate Digital Media: Interactive Technology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): digital art course or consent of instructor. Create interactive digital artworks in both time-based and environmental forms; explore issues including interactivity, interface design, activism, and multiple narratives. Does not cover software training or commercial graphic design.

ART 169 (E-Z) Digital Imaging Software For the Visual Arts: Intermediate Software Skills 1 Lecture, 6 hours per quarter; laboratory, 12 hours per quarter. Prerequisite(s): ART 003 or MCS 004 or ART 004 or ART 009 or ART 065 or ART 066. Covers digital imaging application across varied media. Includes Web design, digital video editing, video compositing and effects, Web authoring, digital photography, and desktop publishing. Targets specific software that aid in developing digital production skills that can be applied to a wide array of intermediate course work. E. Image Manipulation (adobe

Photoshop); F. Video Editing (finalcut Pro, Avid, Media 100); G. Web Authoring (dreamweaver, Quicktime); J. Graphic Design And Desktop Publishing (quark). Course is repeatable to a maximum of 3 units.

ART 171 Intermediate and Advanced Sculpture and Digital Technology 4 Lecture, 2 hours; laboratory, 4 hours; individual study, 2 hours. Prerequisite(s): ART 005, ART 066. Covers intermediate and advanced three-dimensional modeling and printing resulting in sculpture derived entirely from the computer. Emphasizes individual projects with the potential to create both computer-based models and material-based sculptures. Discusses new digitally based sculptural possibilities in relation to historical sculptural practice. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable to a maximum of 8 units.

ART 175 Advanced Digital Workshop 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ART 131/MCS 131 or ART 139 or ART 150/MCS 150. Designed to encourage the development of individual projects utilizing digital technology. Areas of inquiry may include, but are not limited to, digital imaging, Web-based works, forms of digital publishing, digital video, and digital multimedia installation. Involves laboratory exercises, lectures, discussion of articles and exhibitions, and self-directed assignments.

ART 180 Contemporary Issues and Practice 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): any lower-division studio art course. A course structured around a sequence of three to six visiting artists, authors, and critics. Visitor presentations will be augmented by relevant articles and in-class presentations. Students generate written and oral responses to specific artists and topics. Artists and topics to be determined by the instructor. Course is repeatable to a maximum of 12 units.

ART 185 Senior Exhibition Seminar 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): restricted to class level standing of senior; restricted to major(s) Art (Studio); review and approval of proposed project for exhibition in quarter prior to exhibition; consent of instructor. Consists of independent work and group seminars. Includes coordination with gallery staff and administration, completion of an artist's statement, and presentation of a finished body of work in public exhibition. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following ART 185 or ART 195.

ART 190 Special Studies 1 to 5 Prerequisite(s): To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Total credit may not exceed 8 units.

ART 195 Senior Thesis 4 Independent work, 12 hours. Prerequisite(s): completion of 32 units of upper-division studio art courses, review of a preliminary portfolio two quarters prior to intended enrollment; or consent of faculty advisor. The student produces and presents a finished body of work to the faculty. Credit is awarded for only one of ART 185 or ART 195.

ART 198I Individual Internship 1 to 12 Field, 2 hours per unit. Prerequisite(s): consent of instructor and upper-division standing. Work with an appropriate professional individual or organization to gain experience and skills in the student's chosen art specialty. Repeatable to a total of 16 units; maximum of 4 units count toward major in Art.

Graduate Courses

ART 230 Contemporary Critical Issues 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Focused analysis of contemporary issues of art and media practice communications theory. Investigates painting, sculpture, photography, digital practice, film, video, fiction, feminism, multicultural studies, and gay and lesbian studies. Involves readings, screenings, visiting artists or critics, and field trips. Course is repeatable to a maximum of 12 units.

ART 240 Current Topics in Critical Theory 4 Seminar, 3 hours, extra reading, 3 hours; research, 2 to 3 hours. Prerequisite(s): graduate standing; ART 006/MCS 006 and ART 160 or equivalents or consent of instructor. Selected theoretical systems as applied to modern, postmodern, and post-postmodern art. Course is repeatable to a maximum of 12 units.

ART 285 Peer Critique 4 Seminar, 3 hours, research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides a serious and sophisticated environment for peer critique of studio production. Involves readings, screenings, and field trips. Course is repeatable.

ART 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours; studio, 3 to 6 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual study of selected topics directed by a faculty member. Course is repeatable.

ART 292 Concurrent Studies in Art 1 to 4 Research, 3 to 12 hours. Prerequisite(s): graduate standing; consent of instructor. Taken concurrently with a 100-series course but on an individual basis. Involves research, critique, studio production, or written work commensurate with the number of units elected. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ART 293 Directed Individual Studio Production 1 to 4 Studio, 3 to 12 hours. Prerequisite(s): graduate standing; consent of instructor; graduate advisor. Independent study with faculty member to evaluate artwork, assess progress and provide criticism. Topics may include historical precedents, theoretical readings and consultation on production or presentation of artworks. Course is repeatable.

ART 299 Research For Thesis 1 to 4 Research, 1 to 6 hours; studio, 3 to 6 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor; satisfactory completion of 28 graduate units in the Masters of Fine Arts program. Individual research with faculty advisor in preparation for comprehensive exhibition for the degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

ART 302 Teaching Practicum 1 to 4 Practicum, 2 to 8 hours; consultation, 1 to 4 hours. Prerequisite(s): graduate standing. Provides supervision of teaching in undergraduate Art courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ART 400 Artist Practice Seminar 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): restricted to major(s) Visual Art; MFA; graduate standing. Provides opportunities for individual studio production and research. Includes work with the faculty member, guest artists, and art professionals. Also includes topic-driven discussions, individual consultation, and group activities. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.



Art History

Subject abbreviation: AHS
College of Humanities, Arts, and Social Sciences

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Associate Professors
Liz Kotz, Ph.D.
Susan Laxton, Ph.D.
Aleca LeBlanc, Ph.D.
Jason Weems, Ph.D.

Assistant Professors
Yong Cho, Ph.D.
Savannah Esquivel, Ph.D.
Fatima Quraishi, Ph.D.

Professor Emeriti
Malcolm Baker, Ph.D. *Distinguished Professor*
Françoise Forster-Hahn, Ph.D. *Distinguished Professor*
Ginger C. Hsü, Ph.D.
Conrad Rudolph, Ph.D. *Distinguished Professor*

Major

The Art History major provides the framework for the critical study of a wide range of global art and visual culture from different periods of human history and in all media.

The department works closely at both the undergraduate and graduate levels with the UCR California Museum of Photography to give students an opportunity to work with archival and art photographs and with the Jack and Marilyn Sweeney Art Gallery to provide access to cutting-edge multimedia works of art and to give the possibility of gaining curatorial experience.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Undergraduate Studies section.

Major Requirements

Art History Major

The major requirements for the B.A. in Art History are as follows: (52 units)

1. **Lower-division requirements (12 units):** one lower-division course in each of the three major areas. Note: No course that appears in more than one area can be repeated
   a) Pre-modern: AHS 013, AHS 015, AHS 016, AHS 017A or AHS 017HA, AHS 017B or AHS 017HB, AHS 027/ANTH 027/LNST 027
   b) Early Modern: AHS 013, AHS 015, AHS 016, AHS 017B or AHS 017HB, AHS 017C or AHS 017HC, AHS 023, AHS 028/LNST 028
   c) Modern/Contemporary: AHS 008, AHS 013, AHS 017C or AHS 017HC, AHS 020/MCS 023, AHS 021/URST 021, AHS 023, AHS 028/LNST 028
2. **Upper-division requirements (40 units)**
   a) AHS 192
   b) Two courses in each of the major areas (24 units). Note: No course that appears in more than one area can be repeated.
      (1) Pre-modern: AHS 112/ANTH 151/LNST 112, AHS 116/LNST 116, AHS 117/ANTH 157/LNST 117, AHS 125, AHS 126, AHS 133/ANTH 161/GSST 130/HISE 149, AHS 138/AST 138, AHS 139/AST 139, AHS 143/AST 143, AHS 144/AST 144, AHS 146/AST 147, AHS 147, AHS 155, AHS 156, AHS 157, AHS 158
      (2) Early Modern: AHS 113, AHS 116/ LNST 116, AHS 117/ANTH 157/LNST 117, AHS 125, AHS 126, AHS 133/ANTH 161/GSST 130/HISE 149, AHS 134/HISE 134, AHS 138/AST 138, AHS 139/AST 139, AHS 143/AST 143, AHS 144/AST 144, AHS 146/AST 147, AHS 158, AHS 160, AHS 161, AHS 162, AHS 163, AHS 165/HISE 133/WMST 170, AHS 167, AHS 170, AHS 171, AHS 172, AHS 173, AHS 177
      (3) Modern/Contemporary: AHS 107, AHS 114/LNST 114, AHS 115/LNST 115, AHS 116/LNST 116, AHS 120/EUR 110B/CPLT 110B/MCS 178/GER 110B, AHS 124/LNST 124, AHS 133/ANTH 161/GSST 130/HISE 149, AHS 134/HISE 134, AHS 135, AHS 136/MCS 137, AHS 137/MCS 138, AHS 138/AST 138, AHS 144/AST 144, AHS 146/AST 147, AHS 158, AHS 175, AHS 176/MCS 176, AHS 177, AHS 178/URST 178, AHS 179, AHS 180, AHS 181, AHS 182, AHS 183, AHS 184/URST 184, AHS 186/MCS 186, AHS 188, AHS 189 (E- Z), AHS 191
3. **Twelve (12) elective units of upper-division course work in Art History chosen from the three major areas:**

Art History/Administrative Studies Major

The major requirements for the B.A. degree in Art History/Administrative Studies are as follows:

Art History requirements (48 units)

1. **Lower-division requirements (12 units):** one lower-division course in each of the three major areas. Note: No course that appears in more than one area can be repeated
   a) Pre-modern: AHS 013, AHS 015, AHS 016, AHS 017A or AHS 017HA, AHS 017B or AHS 017HB, AHS 018/AST 018, AHS 027/ANTH 027/LNST 027, AHS 030/HIST 027/CLA 017
   b) Early Modern: AHS 013, AHS 015, AHS 016, AHS 017B or AHS 017HB, AHS 017C or AHS 017HC, AHS 023,

AHS 028/LNST 028

   c) Modern/Contemporary: AHS 008, AHS 017C, AHS 020/MCS 023, AHS 021/URST 021, AHS 023, AHS 028/LNST 028
2. **Upper-division requirements (36 units)**
   a) AHS 192, Junior and Senior Seminar (4 units)
   b) Two courses (24 units total) in each of the major areas (Pre-modern, Early Modern, Modern/Contemporary) Note: No course that appears in more than one area can be repeated.
   c) Eight (8) elective units of upper-division course work in Art History chosen from the three major areas.

Administrative Studies requirements (37 units)

1. **Lower-division requirements (17 units)**
   a) BUS 010, BUS 020
   b) STAT 008 or equivalent (may be used to satisfy breadth requirements)
   c) CS 008 (may be used to satisfy breadth requirements)
2. **Upper-division requirements (20 units)**
   a) Two courses (8 units) from the list below:
      (1) ECON 102 or ECON 103 or ECON 104A or ECON130 or ECON 162/BUS 162
      (2) PSYC 140 or PSYC 142
      (3) SOC 150 or SOC 151
      (4) POSC 181 or POSC 182E or POSC 182G or POSC 183 or POSC 186
      (5) ANTH 127 or ANTH127S or ANTH 131

These two courses must be outside the discipline of Art History and cannot be courses included as part of the three-course Business Administration track or their cross-listed equivalents.

   b) A three-course track (12 units) in Business Administration courses from one of the following:
      (1) **Organizations (General):** BUS 100W, BUS 107, BUS 158/ANTH 105, BUS 176/SOC 176, SOC 150, SOC 151
      (2) **Human Resources Management/ Labor Relations:** BUS 100W, BUS 107, BUS 121, BUS 144, BUS 145, BUS 153/ECON 153, BUS 155, BUS 156, BUS 157,

PSYC 142

(3) **Business and Society:** BUS 100W, BUS 102, BUS 107, PHIL 116, POSC 182E, POSC 182G, POSC 186

(4) **Marketing:** BUS 103, and two from BUS 111, BUS 112, BUS 113, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119, BUS 124, BUS 126, BUS 151, BUS 152, BUS 159, BUS 164, BUS 182

(5) **Managerial Accounting/Taxation:** BUS 108, and two from BUS 166, BUS 168A, BUS 168B

(6) **Financial Accounting:** BUS 108, BUS 165A, BUS 165B, BUS 165C, BUS 167

(7) **Finance:** BUS 106/ECON 134 and two from BUS 131, BUS 132, BUS 134, BUS 135, BUS 136, BUS 137, BUS 138, BUS 139, BUS 140E, BUS 141, BUS 147

(8) **Management Information Systems**: BUS 101, BUS 110, BUS 125, BUS 128, BUS 171, BUS 172, BUS 173, BUS 174, BUS 175,
BUS 179

(9) **Production Management:** BUS 104/ STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

Note: In filling the dual requirements of the major students may not count more than two courses toward both parts of their total requirements (Art History requirements and Administrative Studies requirements).

Art History/Religious Studies Major

The Art History/Religious Studies Major combines the disciplinary interest in the history of the visual arts with its related religious content and background.

Major Requirements

The major requirements for the B.A. degree in Art History/Religious Studies are as follows:

Asian Concentration (52 units)

1. **Lower-division requirements (12 units)**
AHS 015, AST 030/CHN 030, RLST 005
2. **Upper-division requirements (40 units)**
   a) Art History (16 units): AHS 125, AHS 126, AHS 138/AST 138, AHS 139/AST 139, AHS 143/AST 143, AHS 144/AST 144, AHS 146/AST 147, CPLT 141
   b) Religious Studies (24 units): choose from RLST 101, RLST 103, RLST 105, RLST 106, RLST 142/AST 142/CHN 142, RLST 144/CPLT 144
3. **Optional 190-level work in either Art History or Religious Studies**

Student-designed Comparative Concentration (52 units)

1. **Lower-division requirements (12 units)**
   a) Art History, choose at least 4 units: AHS 013, AHS 015, AHS 017A or AHS 017HA, AHS 017B or AHS 017HB, AHS 017C or AHS 017HC, AST 030/CHN 030
   b) Religious Studies, choose at least 4 units: RLST 005, RLST 007, RLST 010
2. **Upper-division requirements (40 units)**
   a) Art History, choose at least 12 units: AHS 139/AST 139, AHS 143, AHS 155, AHS 156, AHS 157, AHS 160, AHS 161, AHS 162, AHS 163, AHS 164, AHS 167, AHS 170, AHS 171, AHS 172, AHS 173, CPLT 141
   b) Religious Studies, choose at least 12 units: RLST 100, RLST 101, RLST 103, RLST 105, RLST 106, RLST 111, RLST 121, RLST 128 (E-Z), RLST 130, RLST 131, RLST 135/ HISE 130, RLST 136, RLST 142/AST 142/ CHN 142, RLST 144/CPLT 144
3. **Optional 190-level work in either Art History or Religious Studies**

Western Concentration (At least 52 units)

1. **Lower-division requirements (16 units)**
   a) Art History: AHS 017A or AHS 017HA, AHS 017B or AHS 017HB, AHS 017C or AHS 017HC, AHS 030
   b) Religious Studies, choose at least 4 units: RLST 007, RLST 010
2. **Upper-division requirements (36 units)**
   a) Art History (16 units): choose from AHS 155, AHS 156, AHS 157, AHS 160, AHS 161, AHS 162, AHS 163, AHS 164, AHS 167, AHS 170, AHS 171, AHS 172
   b) Religious Studies (20 units): choose from RLST 100, RLST 111, RLST 121, RLST 128 (E-Z), RLST 130, RLST 131, RLST 135/ HISE 130, RLST 136
3. **Optional 190-level work in either Art History or Religious Studies**

Minor

The minor upper-division requirements are designed to encourage study across art-historical areas, while providing the opportunity for some concentration in one specific area.

Requirements for the minor in Art History are as follows:

1. **Lower-division requirements (8 units):** One lower-division course from two of the three major areas. Note: No course that appears in more than one area can be repeated.
   a) Pre-modern: AHS 013, AHS 015, AHS 016, AHS 017A or AHS 017HA, AHS 017B or AHS 017HB, AHS 027/ANTH 027/LNST 027
   b) Early Modern: AHS 013, AHS 015, AHS 016, AHS 017B or AHS 017HB, AHS 017C or AHS 017HC AHS 023, AHS 028/LNST 028
   c) Modern/Contemporary: AHS 008, AHS 013, AHS 016, AHS 017C or AHS 017HC, AHS 020/ MCS 023, AHS 021/URST 021, AHS 023, AHS 028/LNST 028
2. **Upper-division requirements:** Sixteen (16) upper-division units selected from the three areas listed under the major (No more than 8 units may be selected from any one area.)

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Graduate Program

The Department of the History of Art offers the M.A. and Ph.D. in Art History

The department offers upper-division and graduate courses in the history of European, U.S., Central and Latin American, and Asian visual culture from ancient to contemporary times (including the history of photography), emphasizing the interpretation of art and visual culture in its historical and cultural context.

Admission

Applicants must have completed a bachelor's degree or its approved equivalent from an accredited institution and have attained an undergraduate record that satisfies the standards established by the Graduate Division and University Graduate Council. Applications are accepted in the Fall quarter only. GRE scores are not required of applicants to the M.A. or Ph.D. programs.

Applicants whose first language is not English are required to submit acceptable scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) unless they have a degree from an institution where English is the exclusive language of instruction. Additionally each applicant must submit a writing sample and three letters of recommendation, at least two of which must be academic references.

Areas of Specialization

M.A. and Ph.D. students select one area of specialization from the list below.

Areas of specialization (and related courses)

1. Pre-Modern (AHS 112, AHS 116, AHS 117, AHS 125, AHS 138, AHS 139, AHS 140, AHS 141, AHS 143, AHS 144, AHS 147, AHS 155, AHS 156, AHS 157, AHS 159, AHS 263, AHS 272, AHS 280, AHS 285)
2. Early-Modern (AHS 111, AHS 113, AHS 116, AHS 117, AHS 125, AHS 133, AHS 138, AHS 139, AHS 141, AHS 143, AHS 144, AHS 146, AHS 158, AHS 160, AHS 161, AHS 162, AHS 163, AHS 165, AHS 167, AHS 168, AHS 169, AHS 170, AHS 171, AHS 172, AHS 173, AHS 175, AHS 177, AHS 178, AHS 179, AHS 252, AHS 260, AHS 263, AHS 267, AHS 273, AHS 274, AHS 280, AHS 285)
3. Modern/Contemporary (AHS 107, AHS 111, AHS 114, AHS 115, AHS 116, AHS 120, AHS 124, AHS 133, AHS 135, AHS 136, AHS 137, AHS 145, AHS 146, AHS 158, AHS 175, AHS 176, AHS 177, AHS 178, AHS 179, AHS 180, AHS 181, AHS 182, AHS 183, AHS 184, AHS 185, AHS 186, AHS 188, AHS 189(E-Z), AHS 191, AHS 252, AHS 260, AHS 276, AHS 277, AHS 278, AHS 279, AHS 280, AHS 282, AHS 283, AHS 284, AHS 285, AHS 286, AHS 287)

Oral Qualifying Exams and Final Defense Modality

The Oral Qualifying Exams and the Final Defense can be taken in person, hybrid, or fully remote. Students taking the exam may be present or remote with a mixture of remote and in-person committee participation being possible. The student and their advisor will discuss which

mode best suits the subject matter with the advisor making the final determination.

Master's Degree

The terminal M.A. (Plan I: Thesis) program will allow students to explore the academic study of art history, to pursue careers requiring some graduate education (such as museum education), or to prepare for admission to a Ph.D. program.

Course Work

Candidates must complete a minimum of 48 units as follows. At least 32 of these units must be in graduate level courses. Students may also take courses – with the approval of the graduate advisor – in visual culture offered by the department of Anthropology, Media and Cultural Studies, or other departments or programs at UCR or other UC campuses.

1. **Proseminar and Professional Development requirements (12 units):**
   - AHS 251A
   - AHS 251B
   - AHS 280
2. **Seminar requirements (20 units):**
   - One seminar in student's area of specialization
   - Two seminars outside student's area of specialization
   - Two additional graduate seminars
3. **Elective requirements (16 units):**

   Four additional graduate or upper-division courses (up to 12 units of AHS 297/299 may be applied to this requirement)

Students may also take courses – with the approval of the Graduate Advisor – in visual culture offered by the department of Anthropology, Media and Cultural Studies, or other departments or programs at UCR or other UC campuses.

Students may take as many units of AHS 297 and AHS 299 (thesis research and writing) as desired, but only 12 of these units may be applied to the 16 units of elective requirements for the M.A. degree.

The thesis is the culminating requirement for the M.A. degree. Students must complete a successful oral discussion (the "Thesis Defense Meeting") prior to filing the completed thesis. The thesis should be filed within one year after completing all formal course work.

Language Requirement

M.A. students must demonstrate proficiency in one research language (in addition to English) appropriate to their area of study. The relevant language is chosen in consultation with the graduate advisor and, if possible, the potential M.A. thesis advisor. Ideally, the student should acquire this language proficiency before entering the program. If this is not the case, the language requirement should be fulfilled before the fourth quarter in residence. This requirement is meant to provide the student with an understanding of a research language so that the student can perform graduate level research in this language.

The requirement may be satisfied by completing one of the following options:

1. Complete appropriate coursework with a grade of "B" or better, a UC language or courses equivalent to the following UCR classes:

   CHN 006

   FREN 004 or FREN 009A and FREN 009B

   GER 004 or GER 00lR and GER 002R

   ITAL 004

   JPN 006

   SPN 006
2. Placement Exam
3. Department Language Translation Exam
4. Native Language other than English

Detailed methods are outlined in the department's Graduate Student Handbook.

Doctoral Degree

The Ph.D. will prepare students for academic work as researchers, university instructors, and curators in their fields of expertise.

Admission

The Ph.D. program is conceived in two stages: coursework and candidacy. Students admitted with a bachelor's degree complete two years of coursework (60 units), as well as the language requirements and qualifying exams before advancing to candidacy. Students who already hold an M.A. in Art History are required to complete one year of coursework (24 units), as well as the language requirements, and the qualifying exams as stated in the program description below. Students admitted post-M.A. usually advance to candidacy after one year of coursework.

Course Work

Candidates for the Ph.D. degree entering with a bachelor's degree complete a minimum of 60 units of required course work, 36 of which must be at the graduate level. The requirements are as follows:

1. **Proseminar and Professional Development requirements (12 units):**

   AHS 251A

   AHS 251B

   AHS 280
2. **Seminar requirements (24 units):**

   Two seminars in student's area of specialization

   Two seminars outside student's area of specialization

   Two additional graduate seminars
3. **Elective requirements (24 units):**

   Six additional graduate or upper-division courses

Students who enter with an M.A. degree complete a minimum of 24 units, 16 of which must be at the graduate level. The Graduate Advisor will review the MA degree transcripts of all incoming students and may require supplemental course work. The requirements are as follows.

1. **Proseminar and Professional Development requirements (12 units):**

   AHS 251A

   AHS 251B

   AHS 280
2. **Seminar requirements (8 units):**

   One seminar in student's area of specialization

   One seminar outside student's area of specialization
3. **Elective requirements (4 units):**

   One graduate or upper-division course

Students may also take courses – with the approval of the Graduate Advisor – in visual culture offered by the department of Anthropology, Media and Cultural Studies, or other departments or programs at UCR or other UC campuses.

Sixth-Quarter Review

All Ph.D. students undergo a comprehensive review no later than the sixth quarter of enrollment in the program, based on a portfolio of writings selected by the student and advisor. The graduate studies committee reviews the student's record and makes one of the following recommendations: proceed, hold, or terminate. Students receiving a hold may reapply once, within three quarters. Students receiving a terminate may continue enrolling for no more than three quarters to complete M.A. requirements.

Only under extraordinary circumstances may a student continue enrolling for more than 9 quarters (including enrollment while an M.A. student at UCR) without permission to proceed to examinations.

Language Requirement

Ph.D. students are required to demonstrate proficiency in two research languages (in addition to English) before advancement to candidacy. For some fields, additional languages may be required for mastery of the primary and secondary literature. The appropriate languages will be determined in consultation with the student's academic advisor and approved by the graduate advisor.

The requirement may be satisfied by completing one of the following options:

1. Complete appropriate coursework with a grade of "B" or better, a UC language or courses equivalent to the following UCR classes:

   CHN 006

   FREN 004 or FREN 009A and FREN 009B

   GER 004 or GER 00lR and GER 002R

   ITAL 004

   JPN 006

   SPN 006
2. Placement Exam
3. Department Language Translation Exam
4. Native Language other than English

Detailed methods are outlined in the department's Graduate Student Handbook.

Written Qualifying Examination

The qualifying examination will take the form of written field reviews. Upon completion of all coursework and language requirements. Each student will write a substantial

literature review of the major field, with the expectation that the review of the major field will demonstrate a broad knowledge of the field in which the dissertation will make a contribution. The field review will then be examined and approved by a panel of faculty readers selected by the student in consultation with their dissertation advisor no later than the end of the winter quarter in the third year.

M.A. in Art History degree for Ph.D. Students (Plan II)

Following the successful completion of the coursework requirements for the Ph.D. and the field reviews, all Ph.D. students who do not hold an accredited M.A. in Art History may apply for an M.A. in Art History.

Oral Qualifying Examination and Advancement to Candidacy

Advancement to candidacy is predicated on successful passage of the required coursework, language exams, and field reviews/oral exams. To advance to candidacy, a student must write a dissertation prospectus and pass a qualifying oral examination. The prospectus consists of a concise explanation of the rationale, scope, and method of the proposed dissertation, and should be prepared in consultation with the dissertation advisor, who must approve it before the oral qualifying exam can be scheduled. The oral examination, which is supervised by a faculty committee as stipulated in the regulations of the Graduate Division, concentrates on the students' preparation of writing a dissertation as indicated by the dissertation prospectus.

Dissertation and Final Oral Examination

A dissertation to be presented as prescribed by the Graduate Council is prepared under the direction of the candidate's dissertation committee. The dissertation itself must make a significant and original contribution to the field of art history, as demonstrated in a final oral examination or defense.

Normative Time to Degree including UCR M.A. is 18 quarters counting time spent as UCR M.A. student or 15 quarters for those entering with an M.A. from another institution.

Lower-Division Courses

AHS 007 World Art: Images, Issues, and Ideas 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. An introduction to artistic achievements of the world's cultures and ways in which they can be viewed. Considers such issues as the use of artworks as historical documents; connections between "high art" and popular culture; and the relationship between artist, viewer, artistic tradition, and society.

AHS 008 Modern Western Visual Culture 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): none. Focuses on broadly defined cultural practices in relation to painting, photography, video, architecture, and film. Introduces historical, aesthetic, and theoretical issues in twentieth-century visual culture, emphasizing political and social themes relevant to contemporary life.

AHS 010 Topics in Art and Architectural History 4 Lecture, 3 hours; Individual study, 3 hours. Prerequisite(s): none. Explores significant themes and topics from the history of art and architecture around the world. Concentrates on particular subtopics to be announced in the Schedule of Classes. Course is repeatable as topics change to a maximum of 24 units. Credit is awarded for only one of AHS 010 or AHS 010S as topics change.

AHS 010S Topics in Art and Architectural History 5 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): none. Explores significant themes and topics from the history of art and architecture around the world. Concentrates on particular subtopics to be announced in the Schedule of Classes. Course is repeatable as topics change to a maximum of 24 units. Credit is awarded for only one of AHS 010 or AHS 010S as topics change.

AHS 013 Arts and Architecture of the Islamic World 4 Lecture, 3 hours; discussion, 1 hour; outside research, 2 hours. Prerequisite(s): none. A survey of the major monuments and themes of the visual arts in the Middle East, North Africa, South Asia, and Spain, from the rise of Islam to present day.

AHS 015 Arts of Asia 4 Lecture, 3 hours; discussion, 1 hour; outside research, 2 hours. Prerequisite(s): none. A survey of the major monuments and themes of the visual arts of India, China, and Japan. Topics include recent archaeological discoveries, Buddhist art, Hindu sculpture and architecture, Zen in art, and the development of Asian pictorial art.

AHS 016 Introduction to the Body in Western Art 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): none. Introduces questions of the human body and how it was depicted and interpreted in works of art from Roman Antiquity to the present, familiarizing them with a broad range of artworks in their specific historical, cultural, medical, social, religious, political and intellectual contexts. Credit is awarded for only one of AHS 016 or AHS 133/ANTH 161/ DNCE 129/GSST 130/HISE 149.

AHS 017A History of Western Art: Prehistoric to Byzantine 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): none. A survey of the visual arts of the ancient Near East and Egypt, the Greek world, and the Roman and Byzantine empires. Topics include the growth of urbanism, art as an expression of religious and political beliefs, and cultural contact as a source of artistic change. Credit is awarded for only one of AHS 017A or AHS 17HA.

AHS 017B History of Western Art: Medieval to Renaissance 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): none. Surveys the visual arts of Europe in the Middle Ages and Renaissance. Includes the religious and political functions of art in the reestablishment of high civilization and the increased status of the individual artist. Credit is awarded for only one of AHS 017B or AHS 17HB.

AHS 017C History of Western Art: Baroque to Modern 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): none. Surveys the visual arts of Europe and America from 1600 through the present. Includes the religious and political roles of art, the rise of secular imagery, the increased role of women in the arts, the impact of popular culture and photography, and other new media in the visual arts. Credit is awarded for only one of AHS 017C or AHS 17HC.

AHS 17HA Honors History of Western Art: Prehistoric to Byzantine 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to AHS 017A. A survey of the visual arts of the ancient Near East and Egypt, the Greek world, and the Roman and Byzantine empires. Topics include the growth of urbanism, art as an expression of religious and political beliefs, and cultural contact as a source of artistic change. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of AHS 017A or AHS 17HA.

AHS 17HB Honors History of Western Art: Medieval to Renaissance 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to AHS 017B. Surveys of the visual arts of Europe in the Middle Ages and Renaissance. Includes the religious and political functions of art in the reestablishment of high civilization and the increased status of the individual artist. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of AHS 017B or AHS 17HB.

AHS 17HC Honors History of Western Art: Baroque to Modern 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to AHS 017C. Surveys of the visual arts of Europe and America from 1600 through the present. Includes the religious and political roles of art, the rise of secular imagery, the increased role of women in the arts, the impact of popular culture and photography, and the other new media in the visual arts. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of AHS 017C or AHS 17HC.

AHS 018 Modern Art: A Broad View 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A broad, critical overview of the 20th-century visual art practices that defied and expanded artistic conventions with emphasizing works that have shaped contemporary art. Global themes and movements include early avant-gardes, abstraction, Pop Art, performance, conceptual art, institutional critique, and postcolonial, feminist, and gendered interventions.

AHS 019 Photography and the Body 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): none. Introduces the history of photography by providing ways of reading, writing, and thinking about photographs through the theme of the body. Focuses on photography's role in forming notions of selfhood and cultural differences. Emphasizes the close analysis of limited examples and a critical approach.

AHS 020 Introduction to Media Art 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the impact of media technology on the visual arts from photography to the Internet. Addresses mechanical reproduction, perception, gender, sexuality, identity, interactivity, cybernetics, and popular culture. Cross-listed with MCS 023.

AHS 021 Introduction to Architecture and Urbanism 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the built environment including buildings, gardens, and cities, examined in terms of historical, cultural, social, technological, and political factors. Emphasis is on examples from Southern California. Credit is awarded for one of the following AHS 021 or AHS 021W.

AHS 021W Introduction to Architecture and Urbanism 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENGL 001B with a grade of C or better, ENGL 007, may be taken concurrently; for concurrent enrollment in ENGL 007, review the course titles or topics in the current online Schedule of Classes to find the corresponding ENGL 007 writing workshop. An introduction to the built environment, including buildings, gardens, and cities, examined in terms of historical, cultural, social, technological, and political factors. This is a writing-intensive course designed to help students improve critical writing skills while writing within the discipline of architectural history. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to English 001C. Credit is awarded for one of the following AHS 021W or AHS 021.

AHS 023 Introduction to American Art 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Surveys the art and visual culture of North America (primarily in the United States) from the first European contact to the present. Emphasizes visual representation as means for cultural encounter; the construction of race, class and gender; and the relationship between art, nation, and identity.

AHS 025 Art of Mesoamerica 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): None. Surveys the art and architecture of Mesoamerica from the Olmec to the fall of the Aztec capital in 1521. Focuses on empire and trade, religion and astronomy, writing systems and the history the book, and cross-cultural interaction through emphasizing the close analysis of artworks and historical texts.

AHS 027 Art of Pre-Columbian America 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): none. A survey course that provides a background to the ancient art of Mexico, Central America, and the Andean region of western South America. Discusses art of pre-Columbian America according to the three broad cultural regions of Mesoamerica, the lower part of central and northwestern South America, and the Andean area. Cross-listed with ANTH 027 and LNST 027.

AHS 028 Art and Architecture of Latin America 4 Lecture, 3 hours; discussion, 1 hour; individual study, 2 hours. Introduces Latin American art and architecture from the European conquest to the present. Topics include religious and secular art and architecture; hybridization of indigenous and imported styles; national styles after independence; Mexican murals; women artists; Latin American modernismo; and Chicano and Border art. Cross-listed with LNS T028.

AHS 030 Rome: the Ancient City 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Traces the development of the city of ancient Rome. Studies the literary and historical evidence alongside the physical remains of the city including its monuments, art, and historical and archaeological remains. Seeks to introduce the Romans and their importance for later ages. Cross-listed with CLA 017, and HIST 027.

Upper-Division Courses

AHS 107 Photography Since 1960 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior or senior standing; or consent of instructor. A critical overview of major historical, social, and political issues in art photography since 1960. Topics include New Documentary, conceptual photography, the Pictures generation, institutional critique, identity politics, the emergence of digital photography, and the cross-categorical expansion of the medium.

AHS 111 The Art and Architecture of Tenochtitlan/Mexico City 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Uses a case study of Mexico City (formerly Tenochtitlan) to introduce Latin America's urban history. Illustrates through murals, mausoleums, pyramids and park show how the connections between art, architecture, and the natural environment (earthquakes, lakes, smog, volcanoes) underpin life and experience in the megalopolis.

AHS 112 The Art of the Aztec Empire 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 027/ANTH 027/LNST 027 or upper-division standing or consent of instructor. An introduction to the art of the Aztec Empire. Studies architecture, sculpture, ceramics, painting, lapidary work, gold work, and feather work. Explores the relationship between art and ritual and art and the imperial state. Cross-listed with ANTH 151 and LNST 112.

AHS 113 Sixteenth-Century Mexico: An Art of Two Worlds 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Explores the art of the first colonial century in Mexico. Investigates the translation of European art forms to the New World, the fate of indigenous traditions, and artistic change in the context of colonialism and evangelization.

AHS 114 History of Brazilian Art and Architecture 4 Lecture, 3 hours; research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. The history of Brazilian art and architecture from the nineteenth century to present. Explores visual culture including painting, sculpture, prints, murals, architecture, urbanism, landscape design, and installation art. Studies artworks and buildings through a social historical framework, taking into consideration topics like colonialism, modernization, underdevelopment, race, nationalism, internationalism, and globalism. Cross-listed with LNST 114.

AHS 115 Modern and Contemporary Art of Latin America 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. A study of Latin American art from circa 1900 to the present. Considers national and regional histories and artistic trajectories beginning with the advent of an artistic avant-garde. Investigates the relationships between European and Latin American developments. Cross-listed with LNST 115.

AHS 116 Architecture and Arts of the Andes 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. An introduction to architecture, urbanism, and related material culture of the Andes from ancient times to the present. Focuses on the diverse and rich architectural heritage of an important building center in the Americas. Addresses architecture's relationship to artistic and material production such as painting, pottery, sculpture, city planning, and textiles. Cross-listed with LNST 116.

AHS 117 Visual Culture of the Incas 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the art, architecture, and urban form of the Inca civilization. Examines how these elements influenced state formation, conquest, and resistance. Includes studies of urban plans, buildings, paintings, textiles, prints, sculpture, metalwork, and ceramics. Cross-listed with ANTH 157 and LNST 117.

AHS 120 Berlin Metropolis in Literature, Film, Music, and Art 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An introduction to the metropolis Berlin as a gateway between the East and West. Explores topography of the city through film, art, music, and literary texts. Considers Berlin's dramatic

transformations as a microcosm of Germany and Europe's troubled history in the twentieth century. Course conducted in English. Cross-listed with CPLT 111, EUR 120, GER 111, and MCS 178.

AHS 124 Conceptual Art in Latin America 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Considers conceptual art made across Latin America, from 1960s to present. Focuses on subversive strategies artists developed to critique military dictatorships then in power, while circumventing legalized censorship. Considers localized versions of conceptual art in Santiago, Buenos Aires, Rio de Janeiro, Havana, Mexico City, and situate them within international movement. Cross-listed with LNST 124.

AHS 125 Illustrations and Illuminations: the Arts of the Book in the Islamic World 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introduction to manuscript production in the Islamic world from simple Qur'ans to opulent manuscripts illustrating Persian literature. Explores the centrality of manuscripts in Islamic artistic culture. Topics include calligraphy, painting styles, patronage, workshop organization, the production of knowledge, conceptions of the artist, and the relationship between word and image.

AHS 126 Sultans and Saints: the Visual and Material Culture of Islam in South Asia 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introduction to the art and architecture of Muslim dynasties in South Asia from the eighth to the eighteenth century. Explores the centrality of manuscripts in Islamic artistic culture. Studies the movement and settlement of religious, political, and intellectual elites throughout the Subcontinent and the buildings and objects they commissioned.

AHS 133 The Body in Western Art: Antiquity to Present 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; Restricted to major(s) Anthropology, Art History, Art History/Admin Studies, Art History/Religious Studies, Gender and Sexuality Studies, History, History/Administrative Studies, History/Law and Society; or consent of instructor. Presents further questions and study of the human body and how it was depicted and interpreted in works of art from Roman Antiquity to the present. Explores a broad range of artworks in their specific historical, cultural, medical, social, religious, political, and intellectual contexts. Cross-listed with ANTH 161, GSST 130, and HISE 149. Credit is awarded for one of the following AHS 133, ANTH 161, GSST 130, HISE 149, or AHS 016.

AHS 135 Postmedia Art 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Covers heterogeneous movements, theories, and practices from the 1960s to the present that have collectively challenged the doctrine of medium specificity. Topics may include dematerialization, conceptual and postconceptual art, performance and body art, earthworks, process art, and experimental sound and radio.

AHS 136 History of Video Art 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. Traces the evolution of video art from the invention of the Portapak and early video collectives to the current ubiquity of video installation, single-channel, and multimedia art. Emphasizes video art in the United States. Cross-listed with MCS 137.

AHS 137 History of Experimental Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. A survey of cinema outside of the economic, institutional, and aesthetic imperatives of mainstream film production. Covers an array of alternative film movements including surrealism and dada, Soviet avant-garde, the Cine 16 Group, French new wave, North American avant-garde, and the artist's film.

AHS 138 Arts of China 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. A survey of Chinese art and culture from the prehistoric to the contemporary. Cross-listed with AST 138.

AHS 139 The Arts of Buddhism 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Explores the history, concepts, and arts of Buddhism. Emphasizes the transmission and cultural translation of pictorial arts within Asia and to Western worlds. Cross-listed with AST 139.

AHS 140 Arts of the Silk Road 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An exploration of visual and material cultures across the Silk Road network. Emphasizes the intersection of local and global spanning the Eurasian region from antiquity to the medieval period.

AHS 141 The Mongol Empire: the World of Genghis Khan and His Descendants 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An exploration of artistic and architectural developments in the Mongol Empire (1206-1368), the largest contiguous land empire in world history.

AHS 143 Text and Image in Chinese Painting 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Examines the art of writing and painting in China, focusing on the close relationship between written language and pictorial image. Reading knowledge of the Chinese language is not necessary. Cross-listed with AST 143.

AHS 144 Arts of Japan 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Major developments in the arts of Japan from the prehistoric to the contemporary period. Emphasizes the social and cultural contexts of religious art, architecture, and master artists through history, with a brief introduction to contemporary art and pop culture. Cross-listed with AST 144.

AHS 145 Contemporary Asian Art 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Explores the wide spectrum of contemporary arts from China, Korea, and Japan in terms of modernism, orientalism/occidentalism, identity politics, and globalization. Cross-listed with AST 146.

AHS 146 The Japanese House 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. History of the traditional Japanese house from prehistoric times to the nineteenth century. Examples used to place the Japanese house within the general history of Japanese architecture and within its social and cultural context. Cross-listed with AST 147.

AHS 147 The Art of Greece 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Explores the architecture, sculpture, painting, and minor arts of ancient Greece from the earliest Archaic Period through the Hellenistic Age.

AHS 155 Cultures in Conflict: Art at the Fall of the Roman Empire 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Covers architecture, mosaic, wall painting, manuscript illumination, and sculpture from the origins of Christianity to the final dissolution of the Roman Empire. Stresses the role of art in the co-optation of the Church by the Empire and then in the aftermath of its fall.

AHS 156 Memory of Empire: the Art of Early Medieval Europe 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Covers manuscript illumination, barbarian jewelry, architecture, and sculpture from the fall of the Roman Empire and through the Carolingian Empire up to the tenth century. Stresses the interplay between indigenous Germanic and foreign classical traditions.

AHS 157 The Medieval Pilgrimage and the Art of Romanesque France 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Covers architecture, sculpture, and illuminated manuscripts of the eleventh and twelfth centuries. Stresses the

role of the pilgrimage and of politics during the period of the revival of monumental architecture and of public sculpture of the Middle Ages.

AHS 158 Self-Portraits: Renaissance to Contemporary Art 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior or senior standing; or consent of instructor. Introduces the history, theory, and practice of self-portraiture in Western art, from its beginnings in Antiquity to contemporary works. Discusses concepts of identity, 'self-fashioning', and artistic thinking chronologically. Introduces major works of art and important interpretations/methods of art history.

AHS 160 Renaissance Architecture 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An introduction to architecture in the period 1400-1600. Explores the major ideas and trends in architecture that took form in this period, including the architects and the ideas that motivated them in their historical context.

AHS 161 Italian Renaissance: Fifteenth- and Sixteenth-Century Florence 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Surveys the painting, sculpture, architecture, and gardens of this period within their historical and cultural context.

AHS 162 Italian Renaissance: Fifteenth- and Sixteenth-Century Rome 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Surveys the painting, sculpture, architecture, and gardens of this period within their historical and cultural context.

AHS 163 Renaissance in Venice: West Meets East 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. An introduction to the art and culture of Venice circa 1420-1600. Addresses central issues of artistic, cultural, and intellectual exchange among Venice, the Eastern Mediterranean, and the North. Discusses major artworks in the fields of painting, sculpture, and architecture.

AHS 165 Women Artists in Renaissance Europe, 1400-1600 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. Surveys the lives and work of women artists in Renaissance Europe. Considers circumstances under which it was possible for women to become artists; how they evolved from practicing in the cloistered convent to participating in the competitive public market place; what they painted; and who their patrons were. Cross-listed with HISE 133, and GSST 170.

AHS 167 Europe in the Early Modern World: Global Artistic Contact and Exchange, 1492-1750 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Explores trade, religious conversion, intersecting traditions, and the creation of new traditions. Examines the mechanisms and cultural consequences of change through time.

AHS 170 Baroque Architecture 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Examines the development of architecture in Europe and the Americas from 1580 to 1750. Explores the concept of buildings and the city as a form of communication; the spread and reformulation of architectural ideas in new contexts; and the rise of the architectural profession.

AHS 171 The Church, the Court, and the People: Art in Seventeenth-Century Europe 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. A study of the dominant trends and figures of Italian, French, Spanish, Flemish, and Dutch Baroque art. Includes the works of Caravaggio, Bernini, Velazquez, and Rembrandt. Emphasizes the development of illusionistic ceiling decoration, the theoretical basis of Baroque art, and the sacred and political uses of art.

AHS 172 Baroque Rome 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. An in-depth examination of Roman art in the seventeenth century. Studies painting, sculpture, architecture, and urban planning in their political and religious contexts. Emphasizes the ecclesiastical and private patrons who transformed Rome into one of the world's most important cities.

AHS 173 Rococo to Revolution: Art in Eighteenth-Century Europe 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Examines major developments in eighteenth-century painting, sculpture, and interior decoration from the emergence of the Rococo to the dawn of Neoclassicism. Explores the response of art to new forms of patronage, the erotics of eighteenth-century art, and how art functioned as social and political commentary.

AHS 175 Industry and Alienation: Late Nineteenth-Century American Art 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. A study of American art from 1848 to 1900. Focuses on social, political, and artistic issues related to industrialization. Explores themes in visual culture; the construction of an American identity; the role of fine arts in American society; and the tensions of class, gender, race, and ethnicity in American art.

AHS 176 Twentieth-Century Photography 1900-1960 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior or senior standing; or consent of instructor. A critical overview of photographic practices in Europe and the United States in the first half of the twentieth century. Topics include pictorialism, the interwar avant-gardes, the rise of documentary, photojournalism, and street photography. Examines technological, conceptual, aesthetic, economic, and social issues.

AHS 177 American Art: Colonial Period to 1900 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Explores painting and architecture in the United States from the colonial period to 1900.

AHS 178 The Modern City 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Examines the modern metropolis from the Industrial Revolution to the present. Explores the history and theory of modern urbanism through case studies of metropolitan areas with a rich urban culture, architecture, and morphologic features. Investigates approaches to the problems of the large urban agglomeration in the context of social Cross-listed with URST 178.

AHS 179 Revolution, Reaction, and Revision: American Art Between the World Wars 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An in-depth study of American art and visual culture during the early twentieth century, focusing on the period between the two world wars. Traces artistic developments in painting, photography, cinema, and material culture. Explores the issues of race, class, gender, and regional identity as addressed in these media.

AHS 180 Modern European Art I: Nineteenth-Century 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. Surveys painting and sculpture in Europe from the French Revolution to the Franco-Prussian War. Introduces the ideas and concepts of modern European art. Traces artistic developments from Neoclassicism to the emergence of Impressionism in a broad cultural, social, and political context.

AHS 181 Modern Art 2: Art in Europe, 1870-1945 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Traces the history of the modern movement from Impressionism to the end of World War II. Focuses on the arts in their interrelationships to the political events and social conditions of the period. Emphasizes the persecution of modernism in Europe under fascism and communism.

AHS 182 Visual Art and Visual Theory After 1945 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Examines visual art since 1945 primarily from Europe and the United States. Traces developments in all media within a historical and theoretical context. Focuses on the rise of postmodernism, analyzing work in relation to theories of representation and cultural identity.

AHS 183 Photography On Display 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Covers various topics related to current exhibitions at the California Museum of Photography. Provides the necessary historical and theoretical background of the specific photographs on display. Addresses the wider museum context of the difference between working photographs, art photographs, and the politics of that designation. Course is repeatable as content or topic changes to a maximum of 12 units.

AHS 184 Modern Architecture 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Explores modern architecture and its sources from 1800 to the present. Cross-listed with URST 184.

AHS 186 Media and Movements: Film, Video, Photography, and the Visual Arts 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on key cultural movements or developments is global arts over the past century. Provides a thematic history of the avant-garde and experimental arts including painting, sculpture, photography, video, film, performance, installation, and new media art. Cross-listed with MCS 186. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

AHS 188 Nineteenth-Century Photography 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Examines the development of photography in the nineteenth century. Addresses the technologies, artistic practices, and social uses of this medium. Focuses on European and American materials, as well as traces the histories of portrait, landscape, scientific, and documentary photography.

AHS 189 (E-Z) Topics in Contemporary Art 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. Addresses selected issues, movements, and artists of importance to international art history since the 1960s. E. Art Since Conceptual Art. Course is repeatable as content or topic changes to a maximum of 12 units.

AHS 190 Special Studies 1 to 5 variable hours. Prerequisite(s): To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable to a maximum of 12 units.

AHS 191 California Modern Art 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): an Art History course or upper division standing or consent of instructor. Explores California visual expression from 1900 to 1980. Provides critical attention to the development of a purportedly unique California art and culture. Focuses on Southern California topics in order to take advantage of local and regional museums, collections, lectures, and events.

AHS 192 Junior and Senior Seminar in Art History 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing in Art History or Art History Administrative Studies. Critical study of selected topics in the history of art and its methods. Topics vary. Course is repeatable to a maximum of 12 units.

AHS 195H Senior Honors Thesis 1 to 4 Thesis, 3 hours to 12 hours. Prerequisite(s): admission to University Honors or consent of the Art History Department. Independent research and preparation of a senior honors thesis completed under the supervision of a faculty member. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 8 units.

AHS 198I Individual Internship 1 to 12 Research, variable hours. Prerequisite(s): consent of instructor and upper-division standing. Individual study or apprenticeship in a museum, art library, or slide and photo archive in order to gain practical experience and skills for future professional work. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

Graduate Courses

AHS 251A Proseminar in Historiography 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the history of the discipline of art history. Covers historiographic traditions from antiquity to the present. Includes instruction in preparing a conference paper as an element of professional training.

AHS 251B Proseminar in Methodology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to current methodologies of art history. Covers the models and approaches in art history and cognate disciplines. Includes instruction in writing the methodological component of a grant application as an element of professional training.

AHS 252 History and Ideology of the Museum 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the history of collecting and the evolution of the museum as a cultural institution in the western world. Includes an investigation of sources, documents, and historiography complemented by a study of museums and collections in the Los Angeles area.

AHS 260 Seminar in Latin American Art 4 Seminar, 3 hours; research, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of Latin American art from the European conquest to the present. Course is repeatable.

AHS 263 Seminar in Islamic Art and Culture 4 Seminar, 3 hours; research, 3 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of Islamic art from the seventh century to the present. Course is repeatable as topics change to a maximum of 24 units.

AHS 267 Seminar in Asian Art 4 Seminar, 3 hours; research, 3 hours; research paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers special topics in Asian art. Course is repeatable.

AHS 272 Seminar in Medieval Art 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Selected issues of the function of art within medieval social, political, theological, and intellectual culture. Course is repeatable.

AHS 273 Seminar in Renaissance Art 4 Seminar, 3 hours; research, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Special topics in Italian and/or Northern Renaissance art. Course is repeatable.

AHS 274 Seminar in Seventeenth- and Eighteenth-Century Art 4 Seminar, 3 hours; research, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Special topics in seventeenth- and eighteenth-century art. Course is repeatable.

AHS 276 Seminar in Nineteenth-Century Art 4 Seminar, 3 hours; research, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of nineteenth-century European and/or American art. Course is repeatable.

AHS 277 Seminar in Twentieth-Century Art 4 Seminar, 3 hours; research, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of twentieth-century European and/or American art. Course is repeatable.

AHS 278 Seminar in Modern Architecture 4 Seminar, 3 hours; research, 3 hours; research paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of nineteenth- and twentieth-century architecture and urbanism. Course is repeatable.

AHS 279 Seminar in American Art 4 Seminar, 3 hours; research, 3 hours; research paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of American art, photography, and visual/material culture from the colonial period to the present. Course is repeatable.

AHS 280 Seminar in Research, Critical Analysis, and Thesis Writing 4 Seminar, 3 hours, research 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers advanced research that helps in conceptualizing a thesis topic, organizing and structuring material, and in writing one chapter of the thesis. Examines research in different fields of the history of art. Explores scholarly issues from a diversity of specializations. Course is repeatable.

AHS 282 Seminar in New Media 4 Seminar, 3 hours; research, 3 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history and theory of photography, film, video, and digital media. Course is repeatable.

AHS 283 Seminar in History of Photography 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the history of photography, with an emphasis on new theories and histories of photographic practice. Students encouraged to do research projects drawing on the collections of the UCR/California Museum of Photography. Course is repeatable.

AHS 284 Seminar in Contemporary Art and Theory 4 Seminar, 3 hours; individual study, 3 hours; research paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Studies of selected topics in contemporary art, photography, and related media, with an emphasis on critical theories of representation and issues of practice. Course is repeatable.

AHS 285 Getty Consortium Seminar 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An intramural seminar at the Getty Research Institute. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable.

AHS 286 Curatorial Seminar 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Initiates the process of bringing the work of the seminar into the public sphere. Students critique contemporary exhibition practice and develop an exhibition concept that successfully communicates the research and debates of the specific topic of study. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 12 units.

AHS 287 Curating as Critical Practice 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): AHS 286. Brings the work of the Curatorial Seminar into the public sphere through a critical examination of the curatorial process and the mounting of a museum exhibition, catalog production, and linked programming. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 12 units.

AHS 290 Directed Studies 1 to 6 Research, variable hours. Prerequisite(s): consent of instructor. Independent work under a staff member's supervision in a particular field. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

AHS 292 Concurrent Analytical Studies 1 to 4 Research, 3 hours to 12 hours. Prerequisite(s): graduate standing and consent of instructor. To be taken concurrently with a 100-series course, but on an individual basis. It will be devoted to research, criticism, and written work of graduate order commensurate with the number of units elected. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

AHS 297 Directed Research 1 to 6 Research, variable hours. Prerequisite(s): consent of instructor, completion of language requirement, and one seminar. Research study or exploratory work toward the development of the thesis. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

AHS 298I Individual Internship 1 to 4 Research, variable hours. Prerequisite(s): graduate standing. Individual study or apprenticeship in a museum, art library, or slide and photo archive in order to gain practical experience and skills for future professional work. Graded Satisfactory (S) or No Credit (NC). Repeatable to a total of 12 units. Not more than 8 units count toward the 40 units required for the M.A.

AHS 299 Research For Thesis Or Dissertation 1 to 12 Thesis, 3 to 36 hours, variable hours. Prerequisite(s): consent of instructor, completion of language requirement, and one seminar. Thesis or Dissertation research and writing. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

AHS 301 Directed Studies in the Teaching of the History of Art 3 Seminar, 2 hours; consultation, 1 hour. Prerequisite(s): graduate standing A program of weekly meetings and individual formative evaluation required of new Art History Teaching Assistants. Covers instructional methods and classroom/section activities. Conducted by the Teaching Assistant Development Program and department faculty. Credit is not applicable toward degree unit requirements. Graded Satisfactory (S) or No Credit (NC).

AHS 302 Teaching Practicum 1 to 4 Lecture, 1 to 4 hours; clinic, 1 hour. Prerequisite(s): limited to departmental teaching assistants; graduate standing. Supervised teaching in upper- and lower-division Art History courses. Required of all Art History teaching assistants. Credit not applicable toward degree unit requirements. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

Asian Studies

Subject abbreviation: AST
College of Humanities, Arts, and Social Sciences

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Setsu Shigematsu (Media & Cultural Studies)
Wendy Weigun Su (Media & Cultural Studies)
Yenna Wu (Comp Lit & Lang)
Yang Ye, Emeriti (Comp Lit & Lang)
Daryle Williams, Dean, *ex officio*

Major

The Asian Studies major affords students the opportunity to study Asia from an interdisciplinary perspective, drawing on courses and faculty from various departments of the College of Humanities, Arts, and Social Sciences. Students are strongly encouraged to consider participating in Education Abroad offered in various Asian locales, including China, Taiwan, Hong Kong, Japan, Vietnam, Singapore, the Philippines, India, and Korea. Students may also participate in the undergraduate intercampus exchange program, which allows any UC student to apply for study for one term at other UC campuses. Both options provide rich opportunities to participate in additional course work on Asia that may be counted toward the major.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The requirements for the B.A. degree in Asian Studies are as follows:

Students can focus on any aspect of Asia and/or Asian America, and are strongly encouraged to select a disciplinary focus in Anthropology, Art History, History, Comparative Literature and Foreign Languages, Ethnic Studies, Music and Culture, Media and Cultural Studies, or Religious Studies. Students may choose to focus on the historical interactions and connections among East, Northeast, South, Southeast, West, and Central Asia peoples, including those

constituting transnational and/or diaspora communities throughout the world. Students interested in Asian diaspora communities are also encouraged to consider a secondary disciplinary focus in Ethnic Studies, leading to a minor in Asian American Studies.

All students are required to enroll in at least 4 units of AST 195 and write a senior thesis during the first or second quarter of their senior year. (This is a substantial paper based on original research under the supervision of one faculty member of the Asian Studies program.)

1. **Lower-division requirements (12 units plus language requirement)**
   a) Two years of basic language instruction in any Asian language (This requirement may be filled by language courses currently offered at UCR or through approved summer language programs. In some cases, the second year requirement may be waived with the approval of the Asian Studies Committee in Charge)
   b) **At least 12 units from the following:**
   AHS 015, AST 022/ MCS 022/JPN 022, AST 023/CPLT 023/JPN 023, AST 030/CHN 030, AST 034/JPN 034, AST 040/CHN 040, AST 045 (E-Z)/HIST 045 (E-Z), AST 046/CHN 046, AST 046W/CHN 046W, AST 047/KOR 047/MCS 047, AST 056/CPLT 056/JPN 056, AST 062/ CPLT 062/SEAS 062, AST 063/CPLT 063/SEAS 063, AST 064/MCS 049/SEAS 064/VNM 064, AST 065/SEAS 065, AST 090, CPLT 029, ETST 005, ETST 005H, HIST 030, HIST 044/RLST 044, HIST 044W/RLST 044W, JPN 035, KOR 042, RLST 005, RLST 005H
2. **Upper-division requirements (40 units)**
   Students are required to enroll in a minimum of one course each from three of the following areas of emphasis.
   a) Asian America: AST 124/MUS 124, ENGL 139, ENGL 139T, ETST 106, ETST 110 (E-Z), ETST 133, ETST 136, ETST 137/SEAS 137, ETST 138, ETST 139, ETST 140, ETST 143A/SEAS 143A, ETST 143B/SEAS 143B, ETST 144, ETST 150, SOC 136
   b) China: AHS 143/AST 143, AST 107/CHN 107/RLST 107, AST 135/CHN 135, AST 136/CHN 136, AST 142/CHN 142/RLST 142, AST 148/CHN 148, AST 185/CHN 185/MCS 169, CHN 105, CHN 108, CHN 110 (E-Z), CHN 115 (E-Z), CHN 190, HIST 180, HIST 181, HIST 182, HIST 191W, MCS 156 (E-Z), MCS 172, RLST 103
   c) Japan/Korea: AHS 144/AST 144, AHS 146/AST 147, AST 112/KOR 112, AST 150/JPN 150, AST 152 (E-Z)/JPN 152 (E-Z), AST 153 (E-Z)/JPN 153 (E-Z), AST 154 (E-Z)/JPN 154 (E-Z), AST 169/MUS 169 (4 units maximum), AST 184/JPN 184/MCS 184, CPLT 142 (E-Z)/GSST 142 (E-Z), CPLT 145/JPN 145, ETST 136, JPN 190, KOR 110 (E-Z), RLST 105
   d) Southeast Asia: ANTH 126/AST 123/DNCE 123/MUS 123, ANTH 140-I, ANTH 176/AST 127/DNCE 127/ETST 172/MUS 127, AST 119/MUS 119, AST 162/HIST 187/SEAS 162/VNM 162, AST 163/CPLT 163/SEAS 163, AST 165 (E-Z)/GSST 165 (E-Z)/SEAS 165 (E-Z)/VNM 165 (E-Z), AST 168/MUS 168 (4 units maximum), AST 170/MUS 170 (4 units maximum), RLST 149/SEAS 149, RLST 150/SEAS 150
   e) Other East, Northeast, South, Southeast, West, or Central Asia: ANTH 128/AST 128/DNCE 128/MUS 128/THEA 176, AST 133/CPLT 144/RLST 144, AST 145/CHN 141/ CLA 141/CPAC 141/POSC 140, PHIL 110, POSC 130, RLST 101, RLST 103, RLST 104, RLST 105, RLST 106, RLST 108, RLST 145/SEAS 145
   f) Senior thesis requirement: 4 units of AST 195

Minor

The Asian Studies minor allows students from any discipline to enhance their studies with a focus on Asian peoples and cultures. The minor consists of 28 units.

1. **Lower-division requirements: 8 units from the following:** AHS 015, AST 022/JPN 022/MCS 022, AST 030/CHN 030, AST 034/JPN 034, AST 040/CHN 040, AST 045 (E-Z)/HIST 045 (E-Z), HIST 044/RLST 044, JPN 035, RLST 005, RLST 005H
2. **Upper-division requirements: 20 units from the following:**
   AHS 140/AST 140, AHS 141/AST 141, AHS 143/AST 143, AHS 144/AST 144, AHS 146/AST 147, ANTH 140I, ANTH 176/AST 127/DNCE 127/ETST 172/MUS 127, ANTH 128/AST 128/DNCE 128/MUS 128/THEA 176, AST 107/CHN 107/RLST 107, AST 124/ MUS 124, AST 135/CHN 135, AST 133/CPLT 144/RLST 144, AST 136/CHN 136, AST 142/CHN 142/RLST 142, AST 148/CHN 148, AST 150/JPN 150, AST 152 (E-Z)/JPN 152 (E-Z), AST 153 (E-Z)/JPN 153 (E-Z), AST 154 (E-Z)/JPN 154 (E-Z), AST 162/HIST 187/SEAS 162/VNM 162, AST 163/CPLT 163, SEAS 163, AST 165 (E-Z)/GSST 165 (E-Z)/SEAS 165 (E-Z)/VNM 165 (E-Z), AST 168/MUS 168 (no more than 2 units may be applied to the minor), AST 169/MUS 169 (no more than 2 units may be applied to the minor), AST 170/MUS 170 (no more than 2 units may be applied to the minor), AST 184/JPN 184/MCS 184, AST 185/CHN 185/MCS 169, AST 190 (no more than 4 units may be applied to the minor), CHN 101A, CHN 101B, CHN 101C, CHN 104, CHN 105, CHN 108, CHN 110 (E-Z), CHN 115 (E-Z), CHN 190, CPLT 143/FREN 143, CPLT 142 (E-Z)/GSST 142 (E-Z), ENGL 139, ENGL 139T, ETST 133, ETST 137/SEAS 137, ETST 138, ETST 140, ETST 143A/SEAS 143A, ETST 144, ETST 150, HIST 180, HIST 181, HIST 182, HIST 191W, JPN 101A, JPN 101B, JPN 101C, JPN 150, JPN 190, PHIL 110, POSC 130, RLST 101, RLST 103, RLST 105, RLST 106, RLST 108

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Lower-Division Courses

AST 022 Introduction to Japanese Film 4 Lecture, 3 hours; discussion, 1 hour; screening, 2 hours. An introduction to major genres, styles, and creators in the Japanese film world. Focuses on formal analysis and critical writing about film. Works studied range from the samurai epics of Kurosawa to recent anime. All films have subtitles. No previous knowledge of Japanese language or culture required. Cross-listed with JPN 022, and MCS 022.

AST 023 Modern Japan and Personal Narrative 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1.5 hours. Introduces major debates in history, politics, and culture through the genres of biography, autobiography, diary, and confession. Explores the parallel construction of the modern nation, the modern language, and the modern self. Traces the development of Japan's "I-novel." Builds skills in close reading by studying the rhetoric of self-narrative. Cross-listed with CPLT 023, and JPN 023.

AST 030 Introduction to Chinese Civilization 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An introduction to Chinese civilization through an interplay of philosophical, historical, religious, and literary readings from the ancient times through the modern age. Uses audiovisual media. All work is in English. Cross-listed with CHN 030, and CPLT 030.

AST 034 Introduction to Classical Japanese Literature 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. A survey of some of the more famous works of premodern Japanese literature from 10th century poetry collections to 18th century puppet plays. Focuses on the relationship among aesthetics, politics, language, and gender. Assignments include manga translations, creative writing, and intensive Web research. Cross-listed with JPN 034.

AST 040 Masterworks of Chinese Literature 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): none. Reading and discussion of selected great works of Chinese literature (in English translation) with attention to cultural contexts. Various critical methods and approaches are used. Cross-listed with CHN 040, and CPLT 041.

AST 045 (E-Z) Topics in Asian History 4 Lecture, 3 hours; consultation, 1 hour. An introduction to regional histories and cultures of Asia. E. Premodern China And Japan; F. Contemporary China; G. India In The Western Imagination. Cross-listed with HIST 045 (E-Z).

AST 046 Responses to Political Repression in Modern Chinese Literature and Film 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An examination of the various responses to political repression in China during the second half of the twentieth century through selected literary and artistic representations. Cross-listed with CHN 046, and CPLT 042. Credit is awarded for one of the following CHN 046, AST 046, CPLT 042, AST 046W, CHN 046W, or CPLT 042W.

AST 046W Responses to Political Repression in Modern Chinese Literature and Film 4 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ENGL 001B with a grade of C or better. An examination of the various responses to political repression in China during the second half of the twentieth century through selected literary and artistic representations. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to English 001C. Cross-listed with CHN 046W, and CPLT 042W. Credit is awarded for one of the following CHN 046W, AST 046W, CPLT 042W, AST 046, CHN 046, or CPLT 042.

AST 047 Introduction to Korean Film 4 Lecture, 3 hours; screening, 2 hours; discussion, 1 hour. An introduction to the major directors and films of Korea. Covers the genres and periods of works produced from the 1960s to the present. All films have English subtitles. No previous knowledge of Korean language or culture required. Cross-listed with KOR 047, and MCS 047.

AST 048 Chinese Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A study of selected films from China and Taiwan focusing on cultural context. Includes what to look for in these films; the interrelations with theater, photography, and literature; and how these films are understood as an art form. Cross-listed with CHN 048, CPLT 048, and MCS 048.

AST 056 Cultures of the Japanese Empire 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers the social histories and literatures of the Japanese Empire from the foundation of the Meiji state to the present. Includes the Ainu, Okinawan, Taiwanese, and Korean cultures. Explores the concepts of assimilation, citizenship, national language, nation-state, sovereignty, total war, and translation. Utilizes readings in English. Cross-listed with JPN 056, and CPLT 056.

AST 062 Introduction to Southeast Asian Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introduction to modern and contemporary Southeast Asian literature and culture with a focus on individual national histories. Explores the relationship between aesthetics, politics, and academic scholarship. Readings are in translation; classes conducted in English. Cross-listed with CPLT 062, and SEAS 062.

AST 063 Reading Southeast Asian Stories 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introduction to the modern short story in Southeast Asia focusing on literariness and the act of reading. Readings are in translation; classes conducted in English. Course is repeatable as content or topic changes to a maximum of 8 units. Cross-listed with CPLT 063, and SEAS 063.

AST 064 Introduction to Vietnamese and Diasporic Film Culture 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Engages in critical viewing strategies and analytical visual critique. Explores the revival of film production in Vietnam following the Vietnam War, with a focus on the means of production, state control, and international distribution. Readings are in translation; classes conducted in English. Cross-listed with VNM 064, MCS 049, and SEAS 064.

AST 067 Language and Text in Contemporary South Asian Religions 4 Seminar, 3 hours; written work, 6 hours. Prerequisite(s): none. Prepares to undertake independent research of literary sources in contemporary South Asian religious traditions, as well as navigating impacts of Hindi and Urdu linguistic traditions. Focuses on the modern linguistic landscape of Hindustani (hybrid Hindi/Urdu) within the context of religious and culturally revered literary texts. Cross-listed with RLST 067.

AST 068 Language and Text Inner Asian Religions 4 Seminar, 3 hours; written work, 6 hours. Prerequisite(s): none. Focuses on classical linguistic landscape of Tibetan and, in some years, classical Mongolian within the context of religious and culturally revered texts and literary practices. Introduces students to advanced study of major classical language and literature. Cross-listed with RLST 068.

AST 090 Special Studies 1 to 5 Individual Study, 3 to 15 hours. To be taken with the consent of the Chair of the Program as a means of meeting special curricular problems. Course is repeatable.

Upper-Division Courses

AST 112 Modern Korean Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of modern Korean literature from the colonial era to the present. Topics include colonialism; cultural influence and exchange; gender, family and sexuality; nation and nationalism; Confucian tradition and patriarchal culture; and modernization and capitalism. Cross-listed with KOR 112.

AST 117 Meditation as Medicine: A Critical Exploration 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A critical exploration of the transformation of Buddhist meditation traditions over the last twenty-five centuries. Addresses the foundational techniques and debates in India; mass meditation as colonial resistance in Burma; recent interest in the brain sciences; and the commodification of mindfulness, compassion, and selflessness in the neoliberal marketplace. Cross-listed with MHHS 119, and RLST 119.

AST 118 (E-Z) Masterworks of Chinese Literature in Translation 4 Lecture, 3 hours; research, 3 hours. Examines canonical Chinese works of literature in translation. Conducted in English. E. Anc Times Thru Early Imper Dyn. Cross-listed with CHN 118 (E-Z).

AST 119 Japanese Music and Culture 4 Lecture, 3 hours; term paper, 1 hour; online discussion and listening, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines Javanese traditional and contemporary music. Focuses on the music of the Javanese gamelan and its relation to larger cosmological themes. Other topics include rural versus court traditions, popular music, mass media, piracy, Hindu roots, modernity, and local practices versus global trends. Cross-listed with MUS 119.

AST 120 Tibetan Buddhism: Dalai Lamas, Tantric Madness, and Mass Monasticism 4 Lecture, 3 hours; term paper, 1 hour; written work, 1 hour; research, 1 hour. Prerequisite(s): Restricted to class level standing of junior, or senior; or consent of instructor. Introduces the globally influential Tibetan Buddhist tradition of the Dalai Lamas, Covers the development of its unique history, doctrine, literary heritage, and gendered ritual cosmologies. Cross-listed with RLST 120

AST 123 Southeast Asian Performance 4 Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the roles and genres of expressive culture in Southeast Asia, including dance, music, theater, film, and digital culture. Performance is discussed as both a time-honored and a contemporary medium for cultural production, from the courts to everyday experience. Cross-listed with MUS 123, ANTH 126, and DNCE 123. SEAS 123

AST 124 Music of Asian America 4 Lecture, 3 hours; music listening, 1 hour; individual study, 2 hours, Prerequisite(s): upper-division standing or consent of instructor. Explores music as a window on the cultural politics of Asian America. Examines expressive culture as a constitutive site for ethnic identities and emergent political formations. Covers music of Asian immigrants and of subsequent generations, including Asian American jazz and hip-hop. Cross-listed with MUS 124.

AST 126 Southeast Asia, Prehistory to 1800 4 Lecture, 3 hours; extra reading, 3. Prerequisite(s): upper-division standing or consent of instructor. Covers the major Southeast Asian historical periods and cultures. Includes prehistory, classical kingdoms, and early modern trading states. Considers the role of ancient stories, religious systems, technologies, and art forms in forming traditional Southeast Asian identities, as well as the influences on these identities from outside the region. Cross-listed with HIST 185, and SEAS 185.

AST 127 Music Cultures of Southeast Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in the Philippines, Indonesia, Malaysia, Thailand, Myanmar (Burma), Laos, Cambodia, and Vietnam. Designed for the student interested in the performing arts and cultures of mainland and insular Southeast Asia. No Western music background is required. Cross-listed with ANTH 176, DNCE 127, ETST 172, MUS 127, and SEAS 127.

AST 128 Performing Arts of Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre,

and ritual in four major geocultural regions of Asia: Central, East, South and Southeast. No Western music training is required. Course is repeatable to a maximum of 8 units. Cross-listed with ANTH 128, DNCE 128, and TFDP 176.

AST 129 Modern Southeast Asia, 1800 to Present 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the formation of modern Southeast Asian nations and cultures since 1800. Compares colonial and postcolonial experiences in the region. Studies the formation of nationalist movements and the relationship of nationalist history with traditional and local histories. Considers the role of the individual, modern media, and global trade in the near-present. Cross-listed with HIST 186, and SEAS 186.

AST 130 History of Philosophy in India 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An examination of the main philosophical themes, figures, and texts in premodern India. Pays particular attention to Hindu, Buddhist, and Jain philosophy. Cross-listed with PHIL 129, and RLST 129.

AST 131 The Buddha's Brain: Mind, Reality, and Power in the Buddhism-Science Dialogue 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A critical history of the "Buddhism-Science dialogue." Focuses on contested characterizations of mind, brain, and personhood. Includes reading and analyzing primary sources in the Indo-Tibetan Buddhist tradition alongside the brain sciences. Prepares for advanced courses and research in religious studies, the medical humanities, and Asian studies. Cross-listed with MHHS 131, and RLST 131.

AST 132 Medical Traditions in China and Greece 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): AST 030 or CHN 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or HISE 110 or CLA 102 or CPAC 102 or CLA 112 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CPAC 112 or CLA 113 or HISE 113 or CLA 120E or CLA 120F or CLA 120G or CLA 120J or CLA 121 or CPAC 121 or POSC 121 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CPAC 141 or AST 145 or CHN 141 or CLA 141 or POSC 140 or CPAC 143 or CHN 143 or RLST 143 or CPLT 030; restricted to class level standing of junior, or senior; or consent of instructor. A comparative examination of the early development of Western medical traditions in classical Greece and the origins and development of the Chinese medical systems (now referred to as traditional Chinese medicine). Focuses on their cultural and social contexts. Cross-listed with CHN 132, CLA 132, and CPAC 132.

AST 133 Buddhist Literature 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores readings in canonical and non-canonical Buddhist texts. Includes Buddhist-influenced literature written by Asian, European, and American authors. Examines themes of emptiness, impermanence, and no-self. Cross-listed with RLST 144.

AST 134 Modern Chinese Literature in Translation 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. An introduction to major works of Chinese fiction, drama, and poetry from the first half of the twentieth century. Considers literary quality and technique, as well as the social and political ideas of Chinese writers during a turbulent time in China's history. Cross-listed with CHN 134. Credit is awarded for one of the following CHN 134, AST 134, or CHN 110M.

AST 135 Great Novels of China 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the social, philosophical, and aesthetic features in major Ming-Qing novels through critical reading and analysis of literature in translation. No knowledge of Chinese required. Cross-listed with CHN 135.

AST 136 Family and Gender in the Chinese Short Story 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines a broad array of short stories from the Tang to the Qing dynasties (approximately ninth to eighteenth century). Investigates love, marriage, family, gender dynamics, and the representation of women in Chinese literature. No knowledge of Chinese required. Cross-listed with CHN 136.

AST 137 Contemporary Chinese Literature in Translation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to important works of fiction, drama, poetry, and reportage from the mid-twentieth century to the present. Includes readings from mainland China, as well as writings from Taiwan and other overseas communities. Cross-listed with CHN 137. Credit is awarded for one of the following CHN 137, AST 137, or CHN 110E.

AST 138 Arts of China 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. A survey of Chinese art and culture from the prehistoric to the contemporary. Cross-listed with AHS 138.

AST 139 The Arts of Buddhism 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Explores the history, concepts, and arts of Buddhism. Emphasizes the transmission and cultural translation of pictorial arts within Asia and to Western worlds. Cross-listed with AHS 139.

AST 142 Zhuangzi 4 Lecture, 3 hours; research, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): CHN 107 or CHN 112 or PHIL 110. An examination of chaos, epistemological and linguistic relativism, fate, skill, and the character of the sage in the Chinese Daoist text Zhuangzi. Discusses the structure and style of this literary masterpiece. Students with knowledge of classical Chinese may arrange additional work through special studies. Cross-listed with CHN 142, and RLST 142.

AST 143 Text and Image in Chinese Painting 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Examines the art of writing and painting in China, focusing on the close relationship between written language and pictorial image. Reading knowledge of the Chinese language is not necessary. Cross-listed with AHS 143.

AST 144 Arts of Japan 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Major developments in the arts of Japan from the prehistoric to the contemporary period. Emphasizes the social and cultural contexts of religious art, architecture, and master artists through history, with a brief introduction to contemporary art and pop culture. Cross-listed with AHS 144.

AST 145 Militarism and Hegemony in the Ancient World 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CHN 030 or AST 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or HISE 110 or CLA 112 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CLA 120E or CPAC 102 or CLA 102 or CPAC 112 or CLA 113 or HISE 113 or CPAC 121 or CLA 121 or POSC 121 or CPAC 132 or AST 132 or CHN 132 or CLA 132 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CLA 143 or CPAC 143 or CHN 143 or RLST 143 or CLA 120F or CLA 120G or CLA 120J or CPLT 030; restricted to class level standing of junior, or senior; or consent of instructor. Comparative study of ancient warfare and hegemony in two or more civilizations of the ancient world. Perspectives may include social and political contexts, gender and war, acquisition of empire, religious wars, and weapons, strategies and tactics in theory and practice. Study of primary source material in texts and visual arts. Cross-listed with CHN 141, CLA 141, CPAC 141, and POSC 140.

AST 146 Contemporary Asian Art 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Explores the wide spectrum of contemporary arts from China, Korea, and Japan in terms of modernism, orientalism/occidentalism, identity politics, and globalization. Cross-listed with AHS 145.

AST 147 The Japanese House 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. History of the traditional Japanese house from prehistoric times to the nineteenth century. Examples used to place the Japanese house within the general history of Japanese architecture and within its social and cultural context. Cross-listed with AHS 146.

AST 148 Chinese Poetry and Poetics in Translation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examination of traditional Chinese poetry through the study of selected major texts. Emphasizes forms, themes, and Chinese poetics in its close relation to the development of Chinese literature. Classes conducted in English. Cross-listed with CHN 148.

AST 150 In Women's Hands: Reading Japanese Women Writers 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines major works of Japanese women writers from Heian (ninth century) to contemporary, focusing on themes, genres, representations of gender, ideas of love and romance, and feminine aesthetics. Readings include fiction, poetry, essays, and drama, with the main emphasis on fictional writing. Classes are conducted in English. Cross-listed with JPN 150.

AST 152 (E-Z) Themes in Modern Japanese Literature 4 Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. An introduction to modern Japanese literature in translation, as seen through the lens of a particular theme or issue. All materials read or viewed in English. E. The End Of The World In Japanese Literature; G. Love And Death; J. Classics And Canon; K. Dreams And Other Virtual Worlds. Cross-listed with JPN 152 (E-Z).

AST 153 (E-Z) Themes in Early Japanese Literature 4 Lecture, 2 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. An introduction to early Japanese literature, as seen through the lens of a particular theme or issue. All works are read in English translation. E. Supernatural Japan; F. Warrior Japan; G. The Culture Of The Floating World: Tokugawa Period Literature, Drama, And Art. Cross-listed with JPN 153 (E-Z).

AST 154 (E-Z) Themes in the Folklore and Popular Culture of Japan 4 Lecture, 2 hours; discussion, 1 hour; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Topics include myth, legend, folktale, folk performance, festival, ritual, and the development of popular or commercial culture. Considers literary versus oral tradition, ethnic identity, authenticity, nationalism, modernity, commodification, and the invention of tradition. E. Ancient Myth To Contemporary Legend: A Study Of Japanese Folk Narrative; F. History Of Japanese Popular Culture. Cross-listed with JPN 154 (E-Z).

AST 160 The Vietnam Wars 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to Vietnamese history in the twentieth century. Covers the three Indochina wars (1945-1986) from different Vietnamese perspectives. Topics include experiences during French colonial rule; the anticolonial movements; periods of French and American military involvement up to 1975; the postwar society; and the post-doi moi society. Cross-listed with HIST 184, SEAS 184, and VNM 184.

AST 161 Translating Modern Southeast Asian Texts 4 Lecture, 3 hours; term paper, 1.5 hours; written work,1.5 hours. Prerequisite(s): upper-division standing; knowledge of one Southeast Asian language is recommended. An introduction to translating modern Southeast Asian texts into English. Presents translations of texts from Vietnam, Indonesia, and the Philippines in a context of theory. Materials are in English. Course is repeatable as content changes to a maximum of 8 units. Cross-listed with SEAS 161.

AST 162 Vietnamese Literary History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. A historical analysis of Vietnamese literature from its oral tradition to contemporary fiction. Follows the formation of the nation-state and the subsequent struggles with the Chinese, French, Japanese, and Americans. No knowledge of Vietnamese required. Readings are in translation or bilingual editions. Classes are conducted in English. Cross-listed with VNM 162, HIST 187, and SEAS 162.

AST 163 Nationalism and the Novel 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the novel and its role within nationalism as a representative summary or mirror of the nation. Cross-listed with CPLT 163, and SEAS 163.

AST 164 Vietnamese American Culture 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the pervasive aspects of Vietnamese American culture. Includes shared histories, acculturation patterns, class diversity, identity struggles, community-building literary and cultural production, youth issues, and cultural survival. Also introduces foundational literature, visual culture, and scholarship in the field. Cross-listed with VNM 164, and SEAS 164.

AST 165 (E-Z) Themes in Vietnamese Literature: Women and War 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. An exploration of Vietnamese literature in translation as seen through the lens of a particular theme or issue. Focuses on the implications of gender and sexuality on nation formation. All materials are read or viewed in English. E. Women And War. Cross-listed with GSST 165 (E-Z), SEAS 165 (E-Z), and VNM 165 (E-Z).

AST 166 Vietnam and the Philippines 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the comparative national histories of Vietnam and the Philippines by way of great literary works in various genres including poetry, short fiction, and novels. All materials are read in English. Cross-listed with CPLT 166, VNM 166, and SEAS 166.

AST 167 Postcolonial Literature and Criticism in Southeast Asia and South Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores how the theoretical concepts of postcolonial criticism inform and challenge the literature of Southeast Asia and South Asia, as the literature itself pushes the limits of the criticism. Addresses themes of nation, identity, space, gender, home, diaspora, alterity, history, sexuality, transnationalism, neocolonialism, tourism, and education. Cross-listed with CPLT 167, and SEAS 167.

AST 168 Javanese Gamelan Ensemble: Beginning 2 Studio, 6 hours. Prerequisite(s): upper-division standing and consent of instructor. Study and performance of the Central Javanese gamelan, consisting mainly of gongs and gong-chime instruments. Readings and discussions focus on Javanese culture. Course is repeatable. Cross-listed with MUS 168 and SEAS 168.

AST 169 Taiko Ensemble 1 Studio, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Study and performance of Japanese drumming. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with MUS 169.

AST 170 Rondalla Ensemble 1 to 2 Studio, 2 to 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Study and performance of the Filipino rondalla, an ensemble consisting of various sizes of lure-like and guitar-like instruments. Discussions focus on Filipino culture. Cross-listed with MUS 170 and SEAS 170. Course is repeatable.

AST 180 Japanese Documentary 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Studies the history of Japanese documentary cinema. Teaches strategies for reading nonfiction visual narrative. Explores other forms of documentation controversial in modern Japanese history including oral testimony, photography, and internet activism. Topics may include war, war protest, peace activism, environmental activism, nuclear politics, and green energy. Course is repeatable as topics and instructor change to a maximum of 8 units. Cross-listed with JPN 180, and MCS 180.

AST 184 Japanese Media and Cultural Studies 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates Japanese media and culture including film, television, video games, manga (comics), anime, music,

and print and digital media. Analyzes the function of media relating to issues of national identity, imperial culture, collective memory, and censorship. Includes transnational circulation of Japanese cultural forms, alternative media, and historical changes in technologies. Cross-listed with MCS 184, and JPN 184.

AST 185 New Chinese Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020, upper-division standing or consent of instructor. A study of representative films from the People's Republic of China, with a focus on those made during the last decade. Conducted in English; most films have English subtitles. Cross-listed with CHN 185, and MCS 169.

AST 186 Hong Kong Cinema: Gender, Genre, and the "New Wave 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Examines contemporary Hong Kong films, specifically the "New Wave" genre. Particular focus is on the sociopolitical conditions of Hong Kong and its relations with Great Britain and China, the linkages of which set the stage for the films and thematic concerns. Cross-listed with MCS 168.

AST 188 (E-Z) Topics in Chinese History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): HIST 180 or HIST 181 or HIST 182; restricted to class level standing of junior, or senior. An in-depth look at important topics in Chinese history. E. Chinese Food Culture; F. Four Great Inventions Of Imperial China; G. Environmental History Of China. Cross-listed with HIST 188 (E-Z).

AST 189 Encountering Vietnam 5 Lecture, 6 hours; tutorial, 6 hours; activity, 6 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Focuses on literary and historical accounts of Vietnam. Utilizes translated travel writings from different genres and eras. Proficiency in Vietnamese not required. Taught in Vietnam and offered only in summer. Offered in Summer only. Cross-listed with HIST 189.

AST 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): upper-division standing or consent of instructor. To be taken with the consent of the Chair of the Program as a means of meeting special curricular problems. Course is repeatable.

AST 195 Capstone Senior Thesis 1 to 4 Thesis, 3 to 12 hours. Prerequisite(s): senior standing. Thesis composition under the guidance of Asian Studies faculty. Required for all Asian Studies majors. Course is repeatable to a maximum of 8 units.

Biochemistry

Subject abbreviation: BCH
College of Natural and Agricultural Sciences

Xuan Liu, M.D., Ph.D., Chair
Graduate Program (951) 827-4116
Undergraduate Program (951) 827-7294
biochemistry.ucr.edu

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Stephanie Dingwall, Ph.D.

Assistant Professors of Teaching
Selene Bobadilla, Ph.D.
Sarah Radi, Ph.D.

Senior Lecturer Emerita
Miriam Ziegler, Ph.D.

Cooperating Faculty
Michael E. Adams, Ph.D. (Entomology/Molecular, Cell and Systems Biology)
Bahman Anvari, Ph.D. (Bioengineering)
Julia Bailey-Serres, Ph.D. (Botany and Plant Sciences)
Devin K. Binder, Ph.D. (Biomedical Sciences)
Katherine A. Borkovich, Ph.D. (Microbiology and Plant Pathology)
Richard Cardullo, Ph.D. (Evolution, Ecology, and Organismal Biology)
Chia-En Chang, Ph.D. (Chemistry)
Sonali Chaturvedi, Ph.D. (Microbiology and Plant Pathology)
Juhong Chen, Ph.D. (Bioengineering)
Meng Chen Ph.D. (Botany and Plant Sciences)
Patrick Degnan, Ph.D. (Microbiology and Plant Pathology)
Adler Dillman, Ph.D. (Nematology)
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Ansel Hsiao, Ph.D. (Microbiology and Plant Pathology)
Hailing Jin, Ph.D. (Microbiology and Plant Pathology)
Ryan Julian, Ph.D. (Chemistry)
Isgouhi Kaloshian, Ph.D. (Nematology)
Fedor Karginov, Ph.D. (Molecular, Cell and Systems Biology)
Thomas Kuhlman, Ph.D. (Physics and Astronomy)
Yanran Li, Ph.D. (Chemical & Environmental Engineering)
Jiayu Liao, Ph.D. (Bioengineering)
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Meera Nair, Ph.D. (Biomedical Sciences)
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Valentine Vullev, Ph.D. (Bioengineering)
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Emma Wilson, Ph.D. (Biomedical Sciences)
Huimin Zhang, Ph.D. (Molecular, Cell and Systems Biology)
Jingsong Zhang, Ph.D. (Chemistry)
Linlin Zhao, Ph.D. (Chemistry)
Sika Zheng, Ph.D. (Biomedical Sciences)
Changcheng Zhou, Ph.D. (Biomedical Sciences)
Nicole Zur Nieden, Ph.D. (Molecular, Cell and Systems Biology)

Major

The three emphases areas within the Biochemistry major are Chemistry, Biology, and Medical Sciences. The Biology and Chemistry emphases are for students interested in postgraduate education or employment in the basic areas of the discipline of Biochemistry. The goal of the Medical Sciences emphasis is to prepare students for admission to postbaccalaureate education in the health professions. The Biology, Chemistry, and Medical Sciences emphases focus on the development of laboratory and critical thinking skills, and hands-on laboratory experience. In addition, participation in an independent research project (BCH 197) or research tutorial (BCH 190), carried out under the supervision of a faculty member, is encouraged. Internships in industry (BCH 198I) are also available, and often lead to valuable job experience and employment opportunities.

The department offers both B.A. and B.S. degrees. The major and emphasis requirements are the same for both, and most students choose the B.S. degree. The B.A. degree requires 12 additional units of Humanities and Social Sciences courses, and 16 units or a course 4 equivalency level of a foreign language (see College Breadth Requirements).

Note: A maximum of 12 units of 190-199 courses may be counted toward the 180 unit graduation requirement. All courses used towards the Biochemistry major requirements must be taken for letter grades.

Transfer Students

Transfer students desiring to major in Biochemistry must have completed:

1. Two quarters of calculus, equivalent to MATH 009A and MATH 009B
2. A year of general chemistry, equivalent to CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, CHEM 01LC
3. A year of organic chemistry, equivalent to CHEM 008A, CHEM 08LA, CHEM 008B, CHEM 08LB, CHEM 008C, CHEM 08LC
4. A course in general biology, equivalent to BIOL 005A and BIOL 05LA

Strongly recommended but not required for admission to the major are:

1. General Biology, equivalent to BIOL 005B and BIOL 005C

2 One quarter of Ordinary Differential Equations, equivalent to MATH 046

3. General physics (calculus-based) equivalent to PHYS 002A, PHYS 002B, PHYS 002C or PHYS 040A, PHYS 040B, PHYS 040C

Students must have a minimum grade point average of 2.70 in transferable college courses.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

Major Requirements

The major requirements and the emphasis requirements are the same for the B.A. and the B.S. degree in Biochemistry. Choose one emphasis.

Continuation in the major requires that the student maintains cumulative and upper division/science GPAs of 2.00 or higher, a GPA of 2.00 or higher in each academic quarter, and makes adequate progress in the major with no more than 16 units of repeated courses. Adequate progress in the major is defined as (a) earning no grade lower than a "C-" in any required lower division mathematics or science course, STAT 010, CHEM 008A, CHEM 08LA, CHEM 008B, CHEM 08LB, CHEM 008C, CHEM 08LC, or any upper division BCH course, and (b) completing MATH 007B or MATH 009B and CHEM 001A by the end of the Fall Quarter of the second year of residence and BCH 110A or BCH 110HA, and BCH 110B or BCH 110HB, by the end of the third year of residence. Freshmen must also complete BCH 095 with a grade of "S" during their first year of residence. BCH 095 may be waived for transfer students and students who change their major after their first year. Freshmen in the Medical Science Emphasis must also complete BCH 096 with a grade of "S" during their first year of residence. BCH 096 may be waived for transfer students and students who change their major after their first year. A student who does not meet these adequate progress standards will be discontinued from the major. In addition, a student who receives a grade of "D+" or lower in any two of the courses in (A) on the first attempt, or in any one of these courses in each of two attempts, will be discontinued from the major. Students who receive a grade lower than "B-" in BIOL 005A or CHEM 008A are strongly encouraged to complete BCH 100 during their second year of residence to better prepare themselves for BCH 110A or BCH 110HA, BCH 110B or BCH 110HB, and BCH 110C or BCH 110HC.

Biology Emphasis

1. **Lower-division requirements (76 units)**
   a) BCH 095 or equivalent, BCH 015
   b) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C
   c) CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, CHEM 01LC
   d) CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC
   e) MATH 007A or MATH 009A, MATH 007B or MATH 009B, MATH 046
   f) PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB, PHYS 002C, PHYS 02LC
   g) STAT 010
2. **Upper-division requirements (40-41 units)**
   a) BCH 110A or BCH 110HA, BCH 110B or BCH 110HB, BCH 110C or BCH 110HC, BCH 162, BCH 184
   b) At least 3 units from BCH 111, BCH 120, BCH 153/BIOL 153/BPSC 153, BCH 180 (E-Z), BCH 183/BPSC 183, BCH 185, BCH 186, BCH 187, BCH 188, BCH 210, BCH 211, BCH 212
   c) BIOL 102
   d) CHEM 109 or CHEM 110A
   e) Choose two biological science courses from the following:
      (1) BCH 111, BCH 120, BCH 153/BIOL 153/BPSC 153, BCH 180 (E-Z), BCH 183/BPSC 183, BCH 185, BCH 186, BCH 187, BCH 188, BCH 210, BCH 211, BCH 212
      (2) BIOL 105, BIOL 108, BIOL 114, BIOL 117, BIOL 119, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 123/MCBL 123/PLPA 123, BIOL 124/MCBL 124, BIOL 128/CBNS 128, BIOL 151, BIOL 155/BPSC 155, BIOL 157, BIOL 159/NEM 159, BIOL 160, BIOL 161A, BIOL 161B, BIOL 171A, BIOL 171B, BIOL 171C, BIOL 171L, BIOL 173/ENTM 173, BIOL 175
      (3) BIOL 104/BPSC 104, BPSC 109/CBNS 109, BIOL 132/ BPSC 132, BIOL 143/BPSC 143, BIOL 148/BPSC 148, BIOL 155/BPSC 155, BPSC 135, BPSC 149
      (4) BIOL 100/ENTM 100, BIOL 173/ENTM 173, ENTM 128
      (5) CBNS 101, CBNS 106, CBNS 116, CBNS 120/PSYC 120, CBNS 120L/PSYC 120L, CBNS 124/PSYC 124, CBNS 125/PSYC 125, CBNS 150/ ENTX 150, CBNS 165, CBNS 169
      (6) ENSC 100
      (7) ENTX 101, CBNS 150/ENTX 150
3. **BCH 190 or BCH 197 are available as elective courses.** Enrollment requires upper division standing and written permission of the supervising faculty member. No more than 9 units of courses numbered 190-199 may be counted towards the major.

Chemistry Emphasis

1. **Lower-division requirements (81 units)**
   a) BCH 095 or equivalent, BCH 015
   b) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C
   c) CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, CHEM 01LC
   d) CHEM 005
   e) CHEM 008A and CHEM 08LA or CHEM-08HA and CHEM 08HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC
   f) MATH 007A or MATH 009A, MATH 007B or MATH 009B, MATH 046
   g) PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB, PHYS 002C, PHYS 02LC
   h) STAT 010
2. **Upper-division requirements (40-41 units)**
   a) BCH 110A or BCH 110HA, BCH 110B or BCH 110HB, BCH 110C or BCH 110HC, BCH 162, BCH 184
   b) At least 3 units from BCH 111, BCH 120, BCH 153/BIOL 153/BPSC 153, BCH 180 (E-Z), BCH 183/BPSC 183, BCH 185, BCH 186, BCH 187, BCH 188, BCH 210, BCH 211, BCH 212, BIOL 119, BPSC 109/CBNS 109, BPSC 149
   c) BIOL 102
   d) CHEM 109 or CHEM 110A
   e) Two courses from CHEM 110B, CHEM 113, CHEM 125, CHEM 150A, CHEM 150B, CHEM 166 (Other graduate courses may be substituted by students with a GPA of 3.00 or better with permission of the instructor and the faculty advisor.)
3. **BCH 190 or BCH 197 are available as elective courses.** Enrollment requires written permission of the supervising faculty member. No more than 9 units of courses numbered 190-199 may be counted towards the major.

Medical Sciences Emphasis

1. **Lower-division requirements (74 units)**
   a) BCH 095 or equivalent, BCH 015
   b) BCH 096, BCH 098I
   c) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C
   d) CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, CHEM 01LC
   e) CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC
   f) MATH 007A or MATH 009A, MATH 007B or MATH 009B
   g) PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB, PHYS 002C, PHYS 02LC

h) STAT 010

2. **Upper-division requirements (40-41 units)**
   a) BCH 110A or BCH 110HA, BCH 110B or BCH 110HB, BCH 110C or BCH 110HC, BCH 120, BCH 162, BCH 184
   b) BIOL 102
   c) CHEM 109 or CHEM 110A
   d) CBNS 101
   e) At least 3 units from BCH 183/BPSC 183, BCH 185, BCH 188, BIOL 119, BIOL 121, BIOL 128/CBNS 128, BIOL 161A, BIOL 161B, BIOL 171A, BIOL 171B, BIOL 171C, BIOL 171L, BPSC 109/CBNS 109, BPSC 149, CBNS 106, CBNS 120/PSYC 120, CBNS 150/ENTX 150, CBNS 165, CBNS 169

Graduate and upper-division courses can be substituted with permission of the instructor and the faculty advisor. Graduate courses require a GPA of 3.0 or greater in the sciences.

Students should be aware that CHEM 005 is often a requirement for admission to professional schools.

Graduate Program

The Department of Biochemistry offers a graduate program leading to the M.S. or Ph.D. degree in Biochemistry and Molecular Biology. This program emphasizes basic biochemistry with research specializations in the areas of molecular biology, physical biochemistry, molecular endocrinology, plant biochemistry and molecular biology, signal transduction, and biomedical research. It is designed for students who are planning a career of research and teaching in biochemistry at colleges and universities or who wish to engage in biochemical investigations of fundamental or applied nature in private, governmental or commercial laboratories.

Admission
Students who have completed a bachelor's degree in physical, biological, chemical, or agricultural sciences are invited to apply to the program. Regardless of the area of their major for the baccalaureate degree, students should have taken the following courses prior to beginning graduate study in biochemistry or plan to make up deficiencies soon after entering graduate school:

1. One year of calculus
2. One year of general physics
3. One year of organic chemistry
4. An introductory course in physical chemistry
5. At least two courses in biology at the upper-division level, including genetics

Doctoral Degree

The Department of Biochemistry offers the Ph.D. degree in Biochemistry and Molecular Biology.

Course Work
The following courses are required. Credit for upper division courses listed below will be given at the discretion of the graduate advisor if equivalent coursework has been taken previously. Students' course requirements are determined in consultation with the graduate advisor for them upon their arrival. The graduate advisor suggests an individualized course program involving classes in biochemistry and subsidiary fields of study, chosen from any of the physical, biological, or agricultural sciences. Although an adequate course preparation is a requisite part of the training program, the department encourages early involvement of the students in research directed toward their dissertations.

BCH 110A-110B-110C: General Biochemistry

BCH 162; or equivalent research experience

BCH 184: Topics in Physical Biochemistry

BCH 210; Biochemistry of Macromolecules

BCH 211; Molecular Biology

BCH 212; Signal Transduction.

BCH 230 series: at least one course

BCH 240 Special topics in Biochemistry; required each quarter from the time the student finds a permanent major professor. The course consists of the laboratory group meeting of the student's Major Professor

BCH 250 Oral Presentation in Biochemistry; this course must be taken prior to Advancement to Candidacy.

BCH 251 Graduate Seminar in Biochemistry; one formal oral presentation is required in the student's first four years in the program.

BCH 252 General Seminar in Biochemistry; must be taken every quarter, when offered except when they present in the seminar, they must enroll in BCH 251 instead. Exceptions to this rule may be made by petition to the Graduate Advisor in cases where the General Seminar in Biochemistry conflicts with the student's Teaching Assistant responsibilities

GDIV 403 Interdisciplinary Seminar: Research and Scholarship Ethics; must be taken once within one year of advancement to candidacy.

Elective Course Requirement: The elective courses consist of at least 9 units of graduate or upper division undergraduate course work in the sciences. Courses taken to satisfy deficiencies at the time of admission cannot be counted toward the elective course requirements.

At the end of the second quarter, students select major professors and are ready to initiate a research project. At the end of the first year, students submit a written report describing their research efforts and relating them to current biochemical work in related areas.

Written and Oral Qualifying Examinations
At the end of the first year, and no later than the end of the second year, students take a comprehensive written qualifying examination consisting of material from BCH 210, BCH 211, and BCH 212.

Upon successful completion of this exam, the student will then submit and orally defend a research report in which they describe the research they have performed thus far and develop a plan for their complete dissertation research project. This fulfills the requirement for an oral qualifying examination. Students completing all necessary requirements are advanced to candidacy for the Ph.D. degree.

Students must sit the comprehensive written exam within the first two years in the program. Unless excused by either the graduate advisor or department chair, failure to sit the examination will be regarded as a failed exam. Students must sit every sequential offering of the exam and no student will be given more than two attempts to achieve a satisfactory grade on the comprehensive written exam.

The Oral Qualifying Exam can be taken in one of the following modes: **In-Person** or **Hybrid**. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. Students taking the exam In-Person are expected to present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the exam on campus in a video enabled room that supports some members physically present and others remote.

Dissertation and Final Oral Examination
Following completion of their research, students submit a written dissertation and conclude their studies with an oral defense of the dissertation.

The Final Defense can be taken in one of the following modes: In-Person or Hybrid. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. Students presenting the Final Defense In-Person are expected to present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the Final Defense on campus in a video enabled room that supports some members physically present and others remote.

Teaching Requirement
As part of the program,each student is required to serve at least two quarters as a teaching assistant.

Professional Development Training
Ph.D. graduate students fulfill their professional training requirement through enrollment in BCH 250, BCH 252 and GDIV 403.

Normative Time to Degree 15 quarters. In the case that a student changes the degree aim from M.S. to Ph.D., normative time will be reset.

Master's Degree

In addition to the Ph.D. program, the department offers two plans for the master's degree (Plan I, Thesis; Plan II, Comprehensive Examination). Both plans require completion of at least 36 course units; for Plan I, a maximum of 12 units may be for thesis research.

Course Work
The following courses offered by the Biochemistry Department, or acceptable substitutes (determined by the Graduate Advisor when the student joins the program), are required:

BCH 110A-110B-110C: General Biochemistry

BCH 162;or equivalent research experience

BCH 184: Topics in Physical Biochemistry

BCH 210; Biochemistry of Macromolecules

BCH 211; Molecular Biology

BCH 212; Signal Transduction.

BCH 230 series: at least one course

BCH 252 General Seminar in Biochemistry; must be taken every quarter, when offered.

No more than 6 units of Biochemistry courses 240, 252, or 261 may be offered in fulfillment of the unit requirement at the 200 level.

In special cases, where it is otherwise impossible to obtain the required number of 200-level graded courses, up to 4 units of Biochemistry 290 may be taken for graded credit. Approval of the Graduate Advisor prior to enrollment is required. Also, a petition must be approved by the Graduate Dean.

Students pursuing Plan II must sit the first comprehensive written exam scheduled following the completion of the coursework. The exam will consist of material from BCH 210, BCH 211 and BCH 212. Unless excused by either the graduate advisor or department chair, failure to sit the examination will be regarded as a failed exam. Students must sit every sequential offering of the exam and no student will be given more than two attempts within one year following completion of the coursework to achieve a satisfactory grade on the comprehensive written exam.

Lower-Division Courses

BCH 010 Introduction to Nutrition 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to the biological basis of human nutrition in the context of plant-animal-microorganism cycles and the characteristics of different food classes. Discusses the effects of nutritional needs, food availability, and the expanding human population. Includes recording and evaluating one's own diet.

BCH 015 Introduction Biochemistry Laboratory 3 Lecture, 1 hour; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA with grade of "C-" or better (CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA may be taken concurrently); or consent of instructor. Introduces basic biochemistry wet laboratory techniques for biological samples. Includes micropipetting, volumetric relationships, dilutions, pH measurement, buffer preparation, spectrophotometry, gel permeation chromatography, and ion-exchange chromatography. Explores the use of molecular graphics for investigation of macromolecular structure-function relationships.

BCH 095 Topics in Biochemistry For Career Planning 1 Seminar, 1 hour. Prerequisite(s): lower-division standing in Biochemistry. Topics include analysis of academic aspects of career goals and options; curriculum planning; undergraduate research opportunities; preparation for postgraduate education; laboratory experiences and evaluation of data; ethics in education and research; research problems in contemporary biochemistry; and modern experimental approaches in biochemistry. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of BCH 095, NASC 091, or NASC 093.

BCH 096 Introduction to Humanitarian and Healthcare Service 1 Lecture, 8 hours per quarter; consultation, 2 hours per quarter. Prerequisite(s): a major in Biochemistry with an emphasis in Medical Sciences. Acquaints students with opportunities for volunteer activities in the humanitarian and healthcare arenas in southern California. Provides students with the opportunity to validate their commitment to a career in the healthcare arena. Requires a term paper. Graded Satisfactory (S) or No Credit (NC).

BCH 097 Research Tutorial in Biochemistry 1 Laboratory, 3 hours. Prerequisite(s): lower-division standing, minimum grade point average of 3.5, approval of undergraduate advisor and consent of instructor. Laboratory tutorial in Biochemistry. To provide biochemistry laboratory experience for exceptional lower-division students. A written report is required at the end of each quarter. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units.

BCH 098I Individual Internship in A Humanitarian Or Healthcare Arena 1 Internship, 3 hours; term paper, 10 hours per quarter. Prerequisite(s): BCH 096; restricted to major(s) Biochemistry; with an emphasis in Medical Sciences; permission by department. Real-world experience is gained by providing community service in a humanitarian or healthcare arena. Requires a written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 2 units.

Upper-Division Courses

BCH 100 Introductory Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A with a grade of C- or better; CHEM 08HB with a grade of C- or better or CHEM 008B with a grade of C- or better; CHEM 08LB with a grade of C- or better or CHEM 08HLB with a grade of C- or better. Introduction to the biochemistry of living organisms based on a study of the structure, function, and metabolism of small molecules and macromolecules of biological significance. Examines selected animals, plants, and microorganisms to develop a general understanding of structure-function relationships, enzyme action, regulation, bioenergetics, and intermediary metabolism. Credit is awarded for one of the following BCH 100 or BCH 100H. Credit is not awarded for BCH 100 if a grade of "C-" or higher has been awarded previously in BCH 110A or BCH 110HA or BCH 110B or BCH 110HB or BCH 110C or BCH 110HC.

BCH 100H Honors Introductory Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A with a grade of C- or better; CHEM 008B with a grade of C- or better or CHEM 08HB with a grade of C- or better; CHEM 08LB with a grade of C- or better or CHEM 08HLB with a grade of C- or better; admission to University Honors. Honors course corresponding to BCH 100. Introduction to the biochemistry of living organisms based on a study of the structure, function, and metabolism of small molecules and macromolecules of biological significance. Examines selected animals, plants, and microorganisms to develop a general understanding of structure-function relationships, enzyme action, regulation, bioenergetics, and intermediary metabolism. Credit is awarded for one of the following BCH 100H or BCH 100. Credit is not awarded for BCH 100H if a grade of C- or higher has been awarded previously in BCH 110A or BCH 110HA, BCH 110B or BCH 110HB, or BCH 110C or BCH 110HC.

BCH 110A General Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A with a grade of "C-" or better; CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC with grades of "C-" or better. Considers the structure and function of biological molecules including proteins, carbohydrates, lipids, and nucleic acids. Credit is awarded for only one of BCH 110A or BCH 110HA.

BCH 110B General Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110A or BCH 110HA with a grade of "C-" or better or consent of instructor. Consideration of metabolic pathways including mechanisms and regulation of catabolism, anabolism, and bioenergetics in living organisms. Credit is awarded for only one of BCH 110B or BCH 110HB.

BCH 110C General Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110A or BCH 110HA with a grade of "C-" or better, BIOL 102 or consent of instructor. BCH 110B or BCH 110HB is highly recommended. Considers regulation of gene expression, protein synthesis, chromatin structure, genome replication, recombination, and repair. Examines both prokaryotic and eukaryotic systems, including recombinant DNA technology, protein engineering, and applications to molecular medicine. Credit is not awarded for BCH 110C if it has already been awarded for BCH 110HC or BIOL 107A.

BCH 110HA Honors General Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A with a grade of C- or better; CHEM 008C with a grade of C- or better, CHEM 08LC with a grade of C- or better or CHEM 08HC with a grade of C- or better, CHEM 08HLC with a grade of C- or better; admission to University Honors. Honors course corresponding to BCH 110A. Considers the structure and function of biological molecules including proteins, carbohydrates, lipids, and nucleic acids. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following BCH 110HA or BCH 110A.

BCH 110HB Honors General Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110A with a grade of C- or better or BCH 110HA with a grade of C- or better; admission to the University Honors Program. Honors course corresponding to BCH 110B. Consideration of metabolic pathways including mechanisms and regulation of catabolism, anabolism, and bioenergetics in living organisms. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following BCH 110HB or BCH 110B.

BCH 110HC Honors General Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110A or BCH 110HA with a grade of "C-" or better. BCH 110B or BCH 110HB is highly recommended. Honors course corresponding to BCH 110C. Considers regulation of gene expression, protein synthesis, chromatin structure, genome replication, recombination, and repair. Examines both prokaryotic and eukaryotic systems, including recombinant DNA technology, protein engineering, and applications to molecular medicine. Credit is not awarded for BCH 110HC if it has already been awarded for BCH 110C or BIOL 107A.

BCH 120 Topics in Human Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100 with a grade of "C+" or better or BCH 110B or BCH 110HB with a grade of "C-" or better or consent of instructor. Lectures on biochemical and molecular aspects of modern endocrinology, nutrition, metabolic diseases, and blood chemistry. Emphasis is on relation of the above topics to medicine. The discussion sections are used for presentations on topical medical problems.

BCH 162 Advanced Biochemistry Laboratory 5 Lecture, 2 hours; laboratory, 9 hours. Prerequisite(s): BCH 015; BCH 110B or BCH 110HB; BCH 110C or BCH 110HC all with grades of "C-" or better, or consent of instructor. Advanced biochemistry laboratory techniques including modern methods of protein engineering, purification, and characterization, enzyme assays, principles of various types of column chromatography, SDS gel and other methods of electrophoresis, centrifugation, and crystallization. Most experiments include quantitative reasoning through data manipulation, numerical simulations, parametric evaluation, and detailed laboratory reports. Satisfactory (S) or No Credit (NC) grading is not available.

BCH 179 RNA Organization in Health and Disease 3 Lecture, 3 hours. Prerequisite(s): BCH 110A with a grade of C- or better or BCH 110HA with a grade of C- or better or BIOL 107A with a grade of C- or better or CBNS 101 with a grade of C- or better; or equivalent; or consent of instructor. Introduces molecular mechanisms and cellular implications of subcellular RNA organization including macromolecular structures, biocondensates, and RNA transport. Focuses first on RNA organization in healthy systems and concludes with dysregulation and disease relevance. Includes a substantial scientific communication component with an emphasis on analyzing, distilling, and presenting results from primary literature.

BCH 180 (E-Z) Advanced Methods in Biochemistry 2 Lecture, 1 hour; seminar, 1 hour. Prerequisite(s): BCH 197, may be taken concurrently or BCH 110C or BCH 110HC or BIOL 107A with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. An introduction and discussion of the experimental approaches and modern techniques in the study of cell growth regulation, signal transduction, and cell death in cancer. E. Gene Regulation; F. Chromatin Research; G. Cell Signaling; I. Structural Biology; J. Biophysical Chemistry; K. Cryoelectron Microscopy; M. Biological Structure/function; N. Genome Stability; O. Genomics And Proteomics; P. Regulation Of Protein Synthesis; Q. Stem Cell Biology; R. Epigenetics; S. Molecular Biology Of Genetic Diseases; T. Biochemistry Of Development And Aging; U. Biochemistry Of Stress Responses. Course is repeatable as content or topic changes to a maximum of 6 units.

BCH 181 Bioanalytical Concepts For Experimental Systems Biology 3 Lecture, 2 hours; seminar, 1 hour. Prerequisite(s): BCH 100 with a grade of C- or better or BCH 100H with a grade of C- or better or BCH 110B with a grade of C- or better or BCH 110HB with a grade of C- or better; or equivalent; or consent of instructor. An in-depth exploration of bioanalytical techniques fundamental to experimental systems biology. Focuses on key methods used to analyze biomolecules, metabolites, and complex biological systems. Designed for those with a foundational understanding of biology and chemistry seeking to apply analytical approaches to modern biological research.

BCH 183 Plant Biochemistry and Pharmacology of Plant Metabolites 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110A or BCH 110HA; BCH 110B or BCH 110HB; or BCH 100; or consent of instructor. Explores plant biochemistry and the significance of plant metabolites in medicine and pharmacology. Focuses on biotechnology, medicinal plants, and plant-derived drugs as well as the biochemical and pharmacological mode-of-action of secondary plant metabolites. Also addresses plant-specific biochemical processes such as photosynthesis. Cross-listed with BPSC 183.

BCH 184 Topics in Physical Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100 with a grade of "C-" or better or BCH 110A or BCH 110HA with a grade of "C-" or better; BIEN 135 with grade of "C-" or better, or CHEM 109 with grade of "C-" or better or CHEM 110A with grade of "C-" or better; or consent of instructor. Explores modern biophysical methods determining the structures of biological macromolecules and relating structure to function. Covers x-ray crystallography, NMR, and cryoelectron microscopy. Addresses imaging and mass spectrometry for determining structure and ultraviolet, visible, infrared, RAMAN, fluorescence, NMR, EPR, and other forms of spectroscopy for relating macromolecular structure to function.

BCH 185 Epigenetics in Development and Disease 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): BCH 110C with a grade of C- or better or BCH 110HC with a grade of C- or better or BIOL 107A with a grade of C- or better; or equivalents. Examines epigenetic regulation of gene expression in mammalian development and human disease. Covers the roles of epigenetic mechanisms in normal homeostasis including mammalian embryogenesis, memory formation, and transgenerational inheritance. Addresses aberrant epigenetic control in major human disorders including cancer, neurological disorders, and systemic disease. Explores epigenetics in regenerative medicine.

BCH 186 Molecular Bioenergetics 3 Lecture, 3 hours. Prerequisite(s): BCH 100 with a grade of C- or better or BCH 100H with a grade of C- or better or BCH 110B with a grade of C- or better or BCH 110HB with a grade of C- or better; BCH 184 with a grade of C- or better; or consent of instructor. Introduction to biological energy transduction. Describes the coupling of oxidative phosphorylation and photosynthesis to adenosine triphosphate (ATP) synthesis and the coupling of ATP hydrolysis to ion transport, chemotaxis, molecular motors, biomimetics, and other biological processes on the basis of recent structural and mechanistic studies of the protein complexes involved.

BCH 187 Fundamentals of Enzymology 3 Lecture, 3 hours. Prerequisite(s): BCH 100 or BCH 110A or BCH 110HA with a grade of C- or better. An introduction to the fundamental principles of enzymology. Specific topics include, acid-base catalysis, strain effects, transition state theory, enzyme kinetics (including isotope effects), enzyme dynamics and enzyme regulation. Considers in detail the reactions of several representative enzymes.

BCH 188 Fundamentals of Genomics Technologies 3 Lecture, 3 hours. Prerequisite(s): BCH 110C with a grade of C- or better or BCH 110HC with a grade of B- or better or BIOL 107A with a grade of C- or better; or equivalent. A systematic overview of leading and emerging genomics technologies. Emphasizes the biochemical and molecular methods behind different genomic technologies and various applications in areas such as functional genomics, developmental biology, metagenomics, and clinical diagnostics. Course appropriate for biochemistry or other biological sciences majors.

BCH 189 Advanced Analysis of Biochemical Methods 2 Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): senior standing in a Biochemistry major, concurrent enrollment in BCH 162, and consent of instructor. Working with a faculty mentor, students investigate the use of a set of biochemical methods through research of the original literature. Includes a term paper that summarizes the current state of the technology/methodology of interest. Satisfactory (S) or No Credit (NC) grading is not available.

BCH 190 Special Studies 2 to 4 Individual Study, 6 to 16 hours. Prerequisite(s): upper-division standing and consent of instructor. Literature review and tutorial in select modern biochemical topics. Course is repeatable.

BCH 197 Research For Undergraduate Students 1 to 4 Prerequisite(s): junior status and consent of the instructor. Directed research and preparation of written report. Course is repeatable.

BCH 198I Internship in Biochemistry 1 to 12 Internship, 3 to 36 hours. Prerequisite(s): BCH 015, consent of instructor, upper-division standing. An internship to provide on-the-job biochemical experience in government, industrial, or clinical laboratories. Each individual project must be approved by the Biochemistry Department and the laboratory director where the internship is to be carried out. A written report is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

Graduate Courses

BCH 204 Genome Maintenance and Stability 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BCH 110HC or BIOL 107A; BIOL 113 or BIOL 114 or CBNS 101; BIOL 102 is strongly recommended; graduate standing. Emphasizes chromosome-based processes that maintain genome integrity and ensure accurate genome transmission during cell division. Topics are drawn from the primary literature and include chromatin structure and composition, DNA repair and recombination, telomere function and chromosome maintenance, mitotic chromosome segregation, and checkpoint surveillance mechanisms. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CMDB 204, and ENTX 204.

BCH 209 Ribonucleic Acid Biology 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BIOL 107A or CBNS 101 or equivalent; graduate standing; or consent of instructor. A comprehensive overview of the multiple functions of ribonucleic acid (RNA) in the cell. Topics include mRNA, rRNA, and tRNA function and metabolism; RNA catalysis and the "RNA world"; eukaryotic and bacterial non-coding RNAs; and bacterial riboswitches. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CMDB 209, and GEN 209.

BCH 210 Biochemistry of Macromolecules 4 Lecture, 4 hours. Prerequisite(s): BCH 110A, BCH 110B, BCH 110C or equivalents; BCH 184 (may be taken concurrently); CHEM 109; graduate standing or consent of instructor. Discussion of recent advances in the knowledge of the molecular architecture of proteins and nucleic acids, especially with respect to new experimental approaches for analyzing their structure and function. Chemistry of the active site of enzymes.

BCH 211 Molecular Biology 3 Lecture, 3 hours. Prerequisite(s): BCH 110A, BCH 110B, BCH 110C or equivalents; graduate standing or consent of instructor. Advanced topics in molecular biology of the biosynthesis and regulation of DNA, RNA, and proteins. Some topics covered include the following: molecular anatomy of genes and chromosomes; DNA repair and recombination; regulation of genes in the cell cycle; telomerase; RNA processing and splicing; RNA editing; regulation of normal genes and oncogenes; chaperones and protein targeting.

BCH 212 Signal Transduction and Biochemical Regulation 3 Lecture, 3 hours. Prerequisite(s): BCH 110A, BCH 110B, BCH 110C or equivalents; graduate standing or consent of instructor. Advanced topics in signal transduction and biochemical regulation. Topics include protein kinases and protein phosphorylation; phosphatases and their role in regulation; function of phosphorylation events in regulation of metabolism and growth; calcium and other ion channels as signal transduction mechanisms; steroid hormones receptor super family; immune system signal transduction events.

BCH 230 (E-Z) Advanced Topics in Biochemistry 2 Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): BCH 100 or BCH 110A, BCH 110B or BCH 110HA, BCH 110HB; graduate standing. Addresses advances in a particular field of biochemistry by analysis of the recent literature. E. Structure Of Biological Molecules; F. Enzyme Catalysis; G. Glycobiochemistry; H. Membrane Biochemistry; I. Cytoskeleton And Extracellular Matrix; J. Metabolism; K. Regulation Of Chromatin Structure And Transcription; M. Genome Stability; N. Regulation Of Protein Synthesis; O. Signal Transduction; P. Emerging Topics In Biochemistry And Molecular Biology; Q. Cell Cycle Regulation; R. Biochemistry Of Stress Responses; S. Biochemistry Of Development And Aging; T. Molecular Basis Of Genetic Diseases; U. Genomics And Proteomics; W. Stem Cell Biology. Course is repeatable.

BCH 231 The Plant Genome 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 107A; or BCH 110A or BCH 110HA, BCH 110B or BCH 110HB, BCH 110C or BCH 110HC; graduate standing; or consent of instructor. Gives students an appreciation for the structure of the plant nuclear, chloroplast, and mitochondrial genomes. Gene structure, regulation of gene expression, transposons, and methods of gene introduction are also emphasized. Cross-listed with BPSC 231.

BCH 240 Special Topics in Biochemistry 2 Lecture, 2 hours. Prerequisite(s): restricted to major(s) Biochemistry; graduate standing; or consent of instructor. Provides oral presentations and intensive small-group discussion of selected topics in the area of specialization of each faculty member. Emphasizes recent advances in the special topic area and varies accordingly. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 56 units.

BCH 250 Oral Presentations in Biochemistry 2 Seminar, 1 hour, discussion, 1 hour, Prerequisite(s): graduate standing. Training and practice in the presentation of biochemical concepts in both short and long seminar formats, using blackboard, overhead projector, and slides. Presentations are immediately and critically evaluated by both faculty and staff. Limited to 10 students.

BCH 251 Graduate Seminar in Biochemistry 2 Seminar, 1 hour, Discussion, 1 hour. Prerequisite(s): BCH 250; graduate standing. Oral reports by graduate students on current research topics in biochemistry.

BCH 252 General Seminar in Biochemistry 1 Seminar, 1 hour. Prerequisite(s): graduate standing. Oral reports by faculty, graduate students, and visiting scholars on current research topics in biochemistry. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BCH 261 Seminar in Genetics, Genomics, and Bioinformatics 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BIOL 261, BPSC 261, ENTM 261, PLPA 261, and GEN 261.

BCH 289 Special Topics in Neuroscience 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussion of selected topics in neuroscience. Content and instructor(s) vary each time course is offered. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with BIOL 289, CHEM 289, ENTM 289, NRSC 289, and PSYC 289.

BCH 290 Directed Studies 1 to 4 Research, 3 to 12 units. Prerequisite(s): graduate standing in Biochemistry; consent of instructor and graduate advisor. Experimental or literature studies on specifically selected topics undertaken under the direction of a staff member. Course is repeatable.

BCH 291 Individual Study in Biochemistry 1 to 6 Prerequisite(s): graduate standing in Biochemistry or consent of instructor. A program of studies designed to advise and assist candidates who are preparing for examinations. Open to M.S. and Ph.D. candidates; does not count toward the unit requirement for the M.S. degree. Graded Satisfactory (S) or No Credit (NC). Repeatable up to 6 units for pre-Master's students and up to 12 units for Ph.D. students prior to successful completion of the qualifying examination.

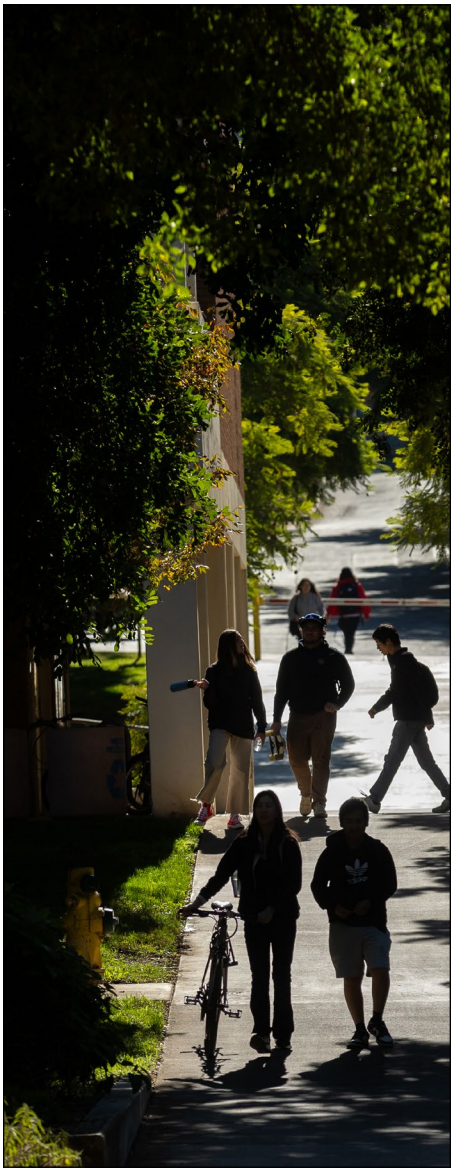
BCH 297 Directed Research 1 to 6 Research, 3 to 36 hours. Prerequisite(s): graduate status in Biochemistry or consent of instructor. Directed research in preparation for dissertation projects performed prior to advancement to candidacy. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BCH 299 Research For Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate status in Biochemistry or consent of instructor. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

BCH 301 Teaching of Biochemistry at the College Level 1 Seminar, 1 hour. Prerequisite(s): graduate standing and consent of instructor. A program of weekly meetings and individual formative evaluations required of new biochemistry teaching assistants. Covers instructional methods and classroom/section activities most suitable for teaching Biochemistry. Conducted by the TA Development Program. Credit not applicable to graduate unit requirements. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BCH 302 Apprentice Teaching 1 to 4 variable hours. Prerequisite(s): graduate standing; limited to departmental teaching assistants. Supervised teaching in lower- and upper-division Biochemistry courses. Required for all Biochemistry teaching assistants. Fulfills portion of the teaching requirements for Ph.D. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.



Bioengineering

Subject abbreviation: BIEN
The Marlan and Rosemary Bourns College of Engineering

Xiaoping Hu, Ph.D., Chair
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Professors
Bahman Anvari, Ph.D.
Xiaoping Hu, Ph.D. *Chair and Provost Fellow*
Victor G. J. Rodgers, D.Sc.
Valentine Vullev, Ph.D.

Professor Emeritus
Jerome S. Schultz, Ph.D. *Distinguished Professor*

Associate Professors
William H. Grover, Ph.D.
Huinan Liu, Ph.D.
Jiayu Liao, Ph.D.
Jin Nam, Ph.D.
B. Hyle Park, Ph.D.

Assistant Professors
Vasileios Christopoulos, Ph.D.
Kevin Freedman, Ph.D.
Jia Guo, Ph.D.
Elena Kokkoni, Ph.D.
Joshua Morgan, Ph.D.
Giulia Palermo, Ph.D.

Cooperating Faculty
Mark Alber, Ph.D. (Distinguished Professor Mathematics)
Bir Bhanu, Ph.D. (Chair and Distinguished Professor Electrical and Computer Engineering)
Devin Binder, Ph.D. (School of Medicine)
Byron Ford, Ph.D. (School of Medicine)
David Lo, Ph.D. (Distinguished Professor School of Medicine)
Aaron Seitz, Ph.D. (Psychology)
Hongdian Yang, Ph.D. (Cell Biology and Neuroscience)

Major

The major in Bioengineering allows students to complete a B.S. degree that provides a basic education to enter the fields of bioengineering and biotechnology.

Bioengineering is rooted in physics, mathematics, chemistry, biology, and the life sciences. It is the application of a systematic, quantitative, and integrative way of thinking about and approaching the solutions of problems important to biology, health, and clinical practice.

Bioengineers develop processes and products that are important for health and treatment of diseases, new materials, protecting environments, and food production. They are employed by the pharmaceutical, biotechnology, medical device, and environmental and food industries. For students interested in medicine, the bioengineering program provides the basic courses to prepare for application to medical schools.

The objective of the bioengineering program is to produce graduates who:

- have a strong foundation to apply science, engineering, and biological principles to meet the challenges at the interface of engineering, life sciences, and medicine
- have the capability to pursue graduate studies, careers in the medical device or biotechnology industries, or entry into medical or other health related professional schools
- are effective as professionals working individually and in teams and can communicate effectively to integrate contributions from multiple disciplines to address biological and medical problems.
- have an appreciation of and sensitivity to a broad range of ethical and social concerns related to bioengineering

The Bachelor of Science in Bioengineering program is accredited by the Engineering Accreditation Commission of ABET, abet.org, under the commission's General Criteria and Program Criteria for Bioengineering and Biomedical and similarly named Engineering Programs. For additional details, see https://www.bioeng.ucr.edu/bachelor-science-bioengineering-program/.

All undergraduates in the College of Engineering must see an advisor at least annually. Visit student.engr.ucr.edu for details.

Change of Major Criteria

All students who request a change of major toBioengineering must meet the following requirements:

- Be in good academic standing
- Have no less than a C- in any Math, Science and Engineering coursework
- Have a minimum 2.0 GPA in all Math, Science and Engineering required coursework
- Be able to complete major within maximum allowable units
- Complete all the courses listed below, based on the total number of units earned, prior to submitting the major change request
- UCR transfer students interested in changing to a BCOE major must have been admissible to the major at point of entry, or must satisfy transfer admission and change of major requirements before earning 120 units
- If changing in the 90-119 units category student must have the ability to complete major within 5 years of entry as a Freshmen or 3 years after entry as a Transfer student
- Students who have earned 120 or more units are not eligible for a change of major in BCOE. NOTE: AP/IB units are excluded from maximum unit calculation

Completed 0 to less than 45 units
Completion of ENGL 001A with C or better and completion of the following with at least 2.500 GPA:

- CHEM 001A or CHEM 01HA
- CHEM 01LA or CHEM 01HLA
- CHEM 001B or CHEM 01HB
- CHEM 01LB or CHEM 01HLB
- MATH 009A or MATH 09HA

Completed 45 to less than 90 units
Completion of ENGL 001A with C or better and completion of the following with at least 2.500:

- BIOL 005A or BIOL 05HA
- BIOL 05LA or BIOL 05HLA
- CHEM 001A or CHEM 01HA
- CHEM 01LA or CHEM 01HLA
- CHEM 001B or CHEM 01HB
- CHEM 01LB or CHEM 01HLB
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC

Completed 90 to less than 120 units
Completion of ENGL 001A and ENGL 001B with C or better and completion of the following with at least 2.500

- BIOL 005A or BIOL 05HA
- BIOL 05LA or BIOL 05HLA
- CHEM 001A or CHEM 01HA
- CHEM 01LA or CHEM 01HLA
- CHEM 001B or CHEM 01HB
- CHEM 01LB or CHEM 01HLB
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A or PHYS 40HA

University Requirements
See Undergraduate Studies section.

College Requirements
See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Bioengineering major uses the following major requirements to satisfy the college's Natural Sciences and Mathematics breadth requirement.

1. BIOL 005A, BIOL 05LA
2. CHEM 001A, CHEM 001B, CHEM 001C
3. MATH 009A

Major Requirements
1. **Lower-division requirements (84 units)**
   a) BIEN 001, BIEN 010
   b) BIOL 005A, BIOL 05LA, BIOL 005B
   c) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC (or CHEM 01HA, CHEM 01HB, CHEM 01HC, CHEM 1HLA, CHEM 1HLB, CHEM 1HLC), CHEM 008A, CHEM 008B, CHEM 08LA, CHEM 08LB, (or CHEM 08HA, CHEM 08HB, CHEM 08HLA, CHEM 08HLB)
   d) CS 009P
   e) EE 005
   f) MATH 009A, MATH 009B, MATH 009C, (or MATH 09HA, MATH 09HB, MATH 09HC) MATH 010A, MATH 010B, MATH 046
   g) PHYS 040A, PHYS 040B, PHYS 040C
2. **Upper-division requirements (70 units)**
   a) BIEN 101
   b) BIEN 105, BIEN 110, BIEN 120, BIEN 125, BIEN 130, BIEN 130L, BIEN 135, BIEN 140A/CEE 140A, BIEN 155, BIEN 175A, BIEN 175B. BIEN 175C
   c) BIEN 115
   d) BIEN 111
   e) Technical electives (16 units): BIEN 136/MSE 136, BIEN 137, BIEN 138, BIEN 140B/CEE 140B, BIEN 142, BIEN 159/CEE 159, BIEN 160, BIEN 165, BIEN 166, BIEN 167

Visit the Student Affairs Office in the College of Engineering or **student.engr.ucr.edu** for a sample program.

Lower-Division Courses
BIEN 001 Introductory Colloquium in Bioengineering 1 Colloquium, 1 hour. Colloquia on current topics in bioengineering and other related fields delivered at an introductory level. Presented by faculty members, visiting scientists, or individuals with industrial bioengineering experience. Graded Satisfactory (S) or No Credit (NC).

BIEN 002 Regulations of in Vitro Systems in Bioengineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 001 with a grade of C- or better; or consent of instructor. Introduces bioengineering methods used and regulations applied to in vitro systems. Includes regulatory standards such as ISO 10993 and 21 CFR; risk management and sample preparation processes utilized in bioengineering industries; assays used in industrial and clinical settings; biomedical image handling; and automation.

BIEN 003 Regulation of in Vivo Systems in Bioengineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 002 with a grade of C- or better; or consent of instructor. Introduction to bioengineering methods and regulations used with in vivo systems. Covers regulatory standards ISO 10993, ISO 13485, IACUC, the animal welfare act, and IRB. Includes overview of invertebrate and vertebrate models in industrial and clinical research, quality management systems, basic physiological modeling, and production of human derived tissue products.

BIEN 010 Overview of Bioengineering 4 Lecture, 3 hours; discussion, 1 hour; practicum, 3 hours. Provides an overview of the various aspects of bioengineering and introduces bioengineering design. Illustrates the application of engineering principles for the design of various products to health science industries. Covers diagnostic instruments, artificial organs, biotechnology, and cell and tissue engineering. Covers engineering ethics.

Upper-Division Courses
BIEN 101 Quantitative Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):BIOL 005A; CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA; MATH 046. Provides Bioengineering students with an in-depth experience in applying mathematical modeling and simulation methods to understand the dynamics of biochemical systems. Prepares for designing new applications of genetic engineering.

BIEN 105 Circulation Physiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 110. Introduces tensor and vector mathematics that describe the conservation of momentum and mass transport in biological sciences, the cardiovascular system, and pulmonary system. Includes constitutive equations, significance of fluid stress in biological vessels, and the physiological relevance of fundamental parameters. Emphasizes the relation between function and system behavior.

BIEN 110 Biomechanics of the Human Body 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C or CHEM 01HC; CS 010A; MATH 010A; PHYS 040B or PHYS 040HB. Introduces the motion, structure, and function of the musculoskeletal system, the cardiovascular system, and the pulmonary system. Topics include applied statics, kinematics, and dynamics of these systems and the mechanics of various tissues (ligament, bone, heart, blood vessels, lung). Emphasizes the relation between function and material properties of these tissues.

BIEN 111 Advanced Statistical Methods and Research Design For Bioengineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C or MATH 09HC; or consent of instructor. Covers topics in applied statistical methods typically used in bioengineering and biomedicine including random variables and probability distributions; statistical inference and null hypothesis significance testing, and Bayesian and nonparametric statistical testing. Also covers research design/execution topics relevant to bioengineering applications including factorial experimental design and ethical conduct of research. Credit is awarded for one of the following BIEN 111 or BIEN 211.

BIEN 112 Biomechanics of Movement 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 110 with a grade of C- or better or PHYS 040A with a grade of C- or better or MATH 046 with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Provides an overview of the biological, mechanical, and neurological mechanisms that guide human movement. Introduces recent innovations and applied methods that build on these fundamentals to measure and evaluate movement for various applications such as rehabilitation, robotics, and sports.

BIEN 115 Quantitative Physiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 110; consent of instructor is required for non-majors. Analyzes engineering aspects of physiological systems. Covers the nervous system, muscular system, respiratory system, renal system, and endocrine system based on fundamental principles of material transport across biological membrane.

BIEN 120 Biosystems and Signal Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 105. Provides basic knowledge for the quantitative analysis of the dynamic behavior of biological systems. Particular applications include neural systems, control of metabolic and hormonal systems, and design of instruments for monitoring and controlling biological systems. Topics include system theory, signal properties, control theory, and transfer functions.

BIEN 125 Biotechnology and Molecular Bioengineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 101. Provides an overview of biochemical processes in cells and their use in developing new products and processes. Presents cellular processes such as metabolism, protein synthesis, enzyme behavior, and cell signaling and control from an engineering viewpoint of modeling and control.

BIEN 130 Bioinstrumentation 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in BIEN 130L; EE 005 with a grade of C- or better. Introduces basic components of instruments for biological applications. Explores sources of signals and physical principles governing the design and operation of instrumentation systems used in medicine and physiological research. Topics include data acquisition and characterization; signal-to-noise concepts and safety analysis; and interaction of instrument and environment.

BIEN 130L Bioinstrumentation Laboratory 2 Laboratory, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in BIEN 130; EE 005 with a grade of C- or better. Provides a laboratory experience with instrumental methods of measuring biological systems. Introduces various sensors and transducers to measure physical, chemical, and biological properties. Covers reliability, dynamic behavior, and data analysis.

BIEN 135 Biophysics and Biothermodynamics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 101, MATH 10B, MATH 046, PHYS 040C or PHYS 040HC. An introduction to the application of thermodynamic principles to understanding the behavior of biological systems. Discusses biophysical properties of biomacromolecules such as proteins, polynucleotides, carbohydrates, and lipids, as well as the methods of characterizing their properties and interactions.

BIEN 136 Tissue Engineering 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): BIOL 005B; CHEM 001C or CHEM 01HC; BIEN 140A or CEE 140A; restricted to class level standing of junior, or senior; or consent of instructor. Covers progress in cellular and molecular biology and engineering. Provides the basis for advancing tissue repair and regeneration with the goal of restoring compromised tissue functions. Presents methods for cell culture, tissue design and development, manipulation of the cell/tissue microenvironment, and current strategies for functional reconstruction of injured tissues. Cross-listed with MSE 136.

BIEN 137 Advanced Biomechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN110, BIOL 005B, MATH 046, PHYS 040A or equivalents; or consent of instructor. Focuses on mechanical characterization of biological tissues at the cellular, organ, and system level. Explores biomechanical factors of physiological and pathological conditions.

BIEN 138 Fundamental Principles of Wound Repair 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 105, BIOL 002 or BIOL 005A, or equivalents; or consent of instructor. Provides fundamental understanding of the molecular and cellular biology of wound repair and regeneration. Focuses on the spatiotemporal roles of inflammatory cytokines; growth factors; extracellular matrix; mechanical forces; tissue cells and adult stem/progenitor cells in soft tissue repair. Topics include embryonic wound regeneration and adult skin and cardiovascular repair.

BIEN 140A Biomaterials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 101 or BCH 100, MATH 010B, PHYS 040B or PHYS 040HB; or consent of instructor. Covers the principles of materials science and engineering with attention given to topics in bioengineering. Explores atomic structures, hard treatment, fundamentals of corrosion, manufacturing processes, and characterization of materials. Cross-listed with CEE 140A.

BIEN 140B Biomaterials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 040B or PHYS 040HB. Covers the structure-property relations of metals, ceramics, polymers, and composites, as well as hard and soft tissues such as bone, teeth, cartilage, ligament, skin, muscle, and vasculature. Focuses on behavior of materials in the physiological environment. Cross-listed with CEE 140B.

BIEN 142 Introductory Biomedical Optical Imaging 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 040C or PHYS 040HC; and MATH 010B; or consent of instructor. Examines fundamental theory and basic design of biomedical optical imaging systems. Topics include a basic understanding of the working principles of optical components, diagnostic light-tissue interaction, and design of imaging systems to exploit the interaction of light with biological phenomena.

BIEN 155 Biotechnology Laboratory 2 Laboratory, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in BIEN 175A or a grade of "C-"or better in BIEN 175A; BIEN 101, BIEN 125. Laboratory experience in cell culture, bioreactors, optical techniques, array techniques, and separation and purification methods.

BIEN 159 Dynamics of Biological Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005B, MATH 046; or consent of instructor. Covers engineering principles for the analysis and modeling of biological phenomena. Topics include molecular diffusion and transport, membranes, ligand-bioreceptor interactions, enzyme kinetics, and dynamics of metabolic pathways. Examines the application of these principles to the design of bioreactors, bioassays, drug delivery systems, and artificial organs. Cross-listed with CEE 159.

BIEN 160 Biomedical Imaging 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 120. An introduction to the fundamental physics and engineering principles for medical imaging systems. Covers X-ray, ultrasound, radionuclide, magnetic resonance imaging, positron emission tomography, optical coherent tomography, and other optical methods. Includes image formation and reconstruction, image characteristics, and quality and image processing.

BIEN 165 Biomolecular Engineering 4 Lecture, 1 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): BIEN 135, or consent of instructor. Emphasizes engineering, biochemical, and biophysical concepts and technologies intrinsic to specific topics of biomolecular engineering. Introduces the history of genetic and protein engineering. Topics include biological thermodynamics, molecular kinetics, biochemical and biophysical approaches, protein engineering, high-throughput screening technologies, and protein engineering with unnatural amino acids.

BIEN 166 Bioinspired Engineering For Sustainable Energy 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 10.Prerequisite(s): BIEN 140A/CEE 140A Introduces the use of concepts from basic biological sciences (including biochemistry and biophysics) for applied energy engineering. Covers biological energy conversion (including photosynthesis) and its implication for sustainable energy technologies. Discusses recent advances in biomimetic and bioinspired energy conversion.

BIEN 167 Medical Diagnostics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 130 or consent of instructor. Provides an overview of medical diagnostics. Topics include methods of biochemical detection, genotyping, DNA sequencing, medical imaging, hematology, microfluidics, epidemiology, diagnostics for point-of-care and resource-limited settings, and case studies of commercially successful diagnostic products.

BIEN 168 Bioengineering Analysis and Modeling 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA or CS 009A or CS 010A or MATH 010B or EE 020A or MATH 045 or MATH 046; or consent of instructor. Introduces numerical techniques for bioengineering phenomena. Topics include biomedical data handling; linear and nonlinear fitting of biological data; iterative solutions to nonlinear and transcendental biomedical problems; stochastic and deterministic models of biology; system level modeling of physiology; and basics of bioinformatic techniques.

BIEN 175A Senior Design 2 Lecture, 1 hour; practicum, 3 hours. Prerequisite(s): BIEN 010 with a grade of C- or better; BIEN 155 with a grade of C- or better, may be taken concurrently, BIEN 130L with a grade of C- or better; restricted to class level standing of senior; restricted to major(s) Bioengineering, Bioengineering BS + MS. Covers the entire design process for bioengineering. Explores intellectual property, quality control, and regulatory and ethical considerations. Requires working in small teams effectively to prepare formal engineering reports, web pages notebooks, oral presentations, a project demonstration, and a business plan.

BIEN 175B Senior Design 4 Lecture, 2 hours; discussion, 1 hour; practicum, 3 hours. Prerequisite(s): BIEN 175A; restricted to class level standing of senior. Covers the entire design process for bioengineering. Explores intellectual property, quality control, and regulatory and ethical considerations. Requires working in small teams effectively to prepare formal engineering reports, web pages notebooks, oral presentations, a project demonstration, and a business plan.

BIEN 175C Senior Design 4 Lecture, 2 hours; discussion, 1 hour; practicum, 3 hours. Prerequisite(s): BIEN 175B. Covers the entire design process for bioengineering. Explores intellectual property, quality control, and regulatory and ethical considerations. Requires working in small teams effectively to prepare formal engineering reports, web pages, notebooks, oral presentations, a project demonstration, and a business plan.

BIEN 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours Prerequisite(s): upper-division standing; consent of instructor and department chair. Provides individual study to meet special curricular needs. Course is repeatable to a maximum of 9 units.

BIEN 197 Research For Undergraduates 1 to 4 Laboratory, 3 to 12 hours. Prerequisite(s): restricted to class level standing of junior, or senior; and consent of instructor. Directed research on a topic relevant to bioengineering. Requires a final written report. Course is repeatable.

BIEN 198 R'course: Variable Topics 1 Activity hours vary per R'Course proposal. Prerequisite(s): permission needed from department; sophomore standing or better. An opportunity for UCR undergraduate students to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original course topics are variable and unique from other departmental course offerings, designed to highlight the student facilitators' expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 8 units.

Graduate Courses

BIEN 201 Mathematical Methods For Bioengineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 146A; or equivalent; first-year standing in the graduate program in Bioengineering. For BIEN 201 online section: enrollment in the online Masters-in-Science in Engineering program; graduate standing. Provides a fundamental grounding in applied mathematics to determine solutions to problems such as biotransport and bioreaction kinetics. Topics include solutions to linear differential equations, analytical methods for partial differential equations, similarity transforms and perturbation methods, regression techniques, and related error analysis.

BIEN 211 Advanced Statistics and Research Design For Bioengineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C or MATH 09HC; or equivalent; graduate standing; or consent of instructor. Covers topics in applied statistical methods typically used in bioengineering and biomedicine including random variables and probability distributions; statistical inference and null hypothesis significance testing, and Bayesian and nonparametric statistical testing. Also covers research design/execution topics relevant to bioengineering applications including: factorial experimental design and ethical conduct of research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following BIEN 211 or BIEN 111.

BIEN 223 Engineering Analysis of Physiological Systems 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): course work in basic biology, calculus, chemistry, and physics; graduate standing or consent of instructor. BIEN 223 online section: enrollment in the Online Master-in-Science in Engineering program. Provides a bioengineering approach to the physiological properties and interactions of various mammalian organ systems. Covers the nervous, muscular, cardiovascular, respiratory, and renal systems. Emphasizes the physical and engineering principles governing these systems by applying quantitative and analytical approaches. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BIEN 224 Cellular and Molecular Engineering 4 Lecture, 2 hours; discussion, 1 hours; practicum, 3 hours. Prerequisite(s): graduate standing or consent of instructor. BIEN 224 online section; enrollment in the Online Master-in-Science in Engineering program. Emphasizes biophysical and engineering concepts intrinsic to specific topics at the cellular and molecular level. Includes receptor-ligand dynamics in cell signaling and function; DNA replication and RNA processing; cellular and protein sorting; control of gene expression; membrane structure, transport and traffic; biological signal transduction; and mechanics of cell division. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 246.

BIEN 225 Self Assembly in Engineered Tissue 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 009A or CS 010A; BIOL 113 or BIOL 114; graduate standing; or consent of instructor. An overview of cellular signaling, motility, adhesion, and invasion. Studies how these mechanisms give rise to tissue morphogenesis, form, structure, and homeostatic organization. Addresses application of these concepts in tissue engineering. Introduces classical modeling techniques for cell behavior. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BIEN 227 Biophotonics: Laser-Tissue Interactions and Therapeutic Applications 3 Lecture, 2 hour; research, .5 hours; extra reading, 1 hour; written work, 1.5 hours. Prerequisite(s): BIOL 005C, CHEM 001C, CS 005, MATH 046, PHYS 002C, or equivalents; graduate standing. Provides an overview of various types of interactions between lasers and biological tissues. Addresses methods of optical properties measurements, mathematical modeling of light propagation, and selected therapeutic applications of lasers. Includes one or two field trips to medical laser centers to observe laser treatment procedures.

BIEN 228 Biophotonics: Optical Diagnosis and Measurements 3 Lecture, 2 hour; research, .5 hours; extra reading, 1 hour; written work, 1.5 hours. Prerequisite(s): BIEN 227. Covers the fundamentals underlying optical diagnostic procedures, including absorption and scattering-based techniques. Also addresses physics of optical tweezers and their applications in biological sciences.

BIEN 233 Computational Modeling of Biomolecules 4 Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): BIOL 005B; CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB; MATH 009C or MATH 09HC; PHYS 040B or PHYS 040HB; basic computer programming experience. Introduces computational methods for the quantitative analysis of biomolecular structures at atomic resolution. Aids in understanding the physicochemical properties of biomolecular function, the prediction of biological properties, and the design of new experiments. Forms the basis for structure-based design of proteins with tailored properties and inhibitors of protein function. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BIEN 234 Orthopaedic Regenerative Engineering and Mechanobiology 4 Lecture, 4 hours. Prerequisite(s): BIEN 110, BIEN 140A, BIOL 005A, and BIOL 005B, or equivalents; graduate standing or consent of instructor. Introduces advanced biomechanics and mechanobiology of skeletal tissues including bone and cartilage. Provides an understanding of structure-function relationship in biological tissues. Focuses on bone and cartilage regenerative engineering approaches based on scaffolds, stem cells, and mechanotransduction.

BIEN 235 Vascular Biomechanics and Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 002, BIOL 005A, BIEN 105, or equivalent; graduate standing or consent of instructor. Provides detailed understanding of the crucial role of mechanical forces in guiding blood vessel formation and function in human health and disease. Topics include embryogenesis, wound repair, atherosclerosis, and cancer. Addresses the principles of biomaterials science and regenerative medicine for promoting therapeutic neovascularization.

BIEN 236 Nanomaterials For Regenerative Medicine 4 Lecture, 4 hours. Prerequisite(s): BIOL 005C, CHEM 001C (or CHEM 01HC), MSE 001, or equivalents; graduate standing or consent of instructor. Covers recent advances in nanomaterial synthesis, fabrication, and characterization. Focuses on the medical applications of nanomaterials and nanotechnologies. Addresses methods of synthesis of nanomaterials such as nanoparticles, nanotubes, and nanofibers. Includes critical design criteria and assessment methods for properties of nanomaterials to meet medical requirements. Cross-listed with MSE 236.

BIEN 237 Medical Diagnostics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Provides an in-depth analysis of current topics in medical diagnostics. Focuses on critical reviews of recent journal articles on diagnostics and case studies of recent commercial diagnostic products. Topics include methods of biochemical detection, genotyping, DNA sequencing, medical imaging, hematology, microfluidics, epidemiology, and diagnostics for point-of-care and resource-limited settings. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BIEN 242 Advanced Biomedical Optical Imaging 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 142 or equivalent; graduate standing or consent of instructor. Examines advanced theory and optimized design of biomedical optical imaging systems. Topics include a full understanding of the working principles of optical components, diagnostic light-tissue interaction, and design of imaging systems to exploit the interaction of light with biological phenomena. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BIEN 245 Optical Methods in Biology, Chemistry, and Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 109 or equivalent; graduate standing; consent of instructor. Covers the origin of fluorescence and other emission processes that modulate the characteristics of molecular emissions. Presents emission-based analytical and bioanalytical methods and techniques. Reviews state-of-the-art instrumentation, including their applicability, limitations, and source. Also provides interpretation and meaning of the measured signals as applied to biological systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes. Cross-listed with MSE 226.

BIEN 249 Integration of Computational and Experimental Biology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B; MATH 010B, MATH 046, PHYS 040C or PHYS 040HC; graduate standing. BIEN 249/CEE 249 online section: enrollment in the Online Master-in-Science in Engineering program. A multidisciplinary introduction to computational methods used to analyze experimental biological data. Introduction to mathematical concepts needed to understand protein structure and dynamics, protein-protein interactions (structures and networks), gene regulatory networks, signal transduction networks, metabolic networks, and kinetic modeling of cellular processes. Also covers techniques used to derive experimental data. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CEE 249.

BIEN 251 Biophotonics: Optical Microscopy and its Biological Applications 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Examines the fundamentals of optical system design and system integration in light microscopy. Covers design components, including light sources, lenses, mirrors, dispersion elements, optical fibers, and detectors. Also covers optical system analysis, transfer functions, magnification, resolution, contrast, and molecular, cellular, organ, and organism applications.

BIEN 260 Special Topics in Bioinstrumentation 1 or 2 Seminar, 1 hour; term paper, 0 or 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on advanced technologies in bioengineering studies, such as spectroscopy, microscopy, magnetic resonance imaging, computed tomography, ultrasonography, and biosensors. Students who submit a term paper receive credit for 2 units; other students receive credit for 1 unit. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

BIEN 261 Special Topics in Biotransport 1 or 2 Seminar, 1 hour; term paper, 0 or 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on advanced methods of analysis of biological transport phenomena such as drug distribution, microcirculation, membrane transport, and transport in organs and tissues. Students who submit a term paper receive credit for 2 units; other students receive credit for 1 unit. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

BIEN 262 Special Topics in Biosignaling 1 or 2 Seminar, 1 hour; term paper, 0 or 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on current research in cell signaling and control, including G protein-coupled receptors, signal transduction and cytoskeletal dynamics, and cell adhesion and cell metabolism. Students who submit a term paper receive credit for 2 units; other students receive credit for 1 unit. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

BIEN 263 Special Topics in Biocomputation 1 or 2 Seminar, 1 hour; term paper, 0 or 3 hours. Prerequisite(s): graduate standing; consent of instructor. Focuses on various advanced methods for computational studies of biomolecules and simulations. Includes Brownian dynamics simulations; Monte Carlo methods; normal mode analysis; electrostatic calculations; and free energy calculations. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

BIEN 264 Biotransport Phenomena 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 105 or equivalent; graduate standing or consent of instructor. BIEN 264 online section: enrollment in the Online Master-in-Science in Engineering program. Covers the mathematical expression and modeling of principles underlying the transport processes of biological systems and biomedical engineering processes. Emphasizes momentum, mass transport, and interpretation of these processes. Topics include advanced development of governing conservation equations and the appropriate constitutive equations for transport in circulation and tissue. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BIEN 265 Special Topics in Biomedical Optical Imaging 1 or 2 Seminar, 1 hour; term paper, 0 or 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on advanced theory, technology, and applications of biomedical optical imaging. Addresses novel sources of optical contrast, current developments in optical imaging instrumentation, and recent advances in their application to bioengineering. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

BIEN 266 Special Topics in Biological Nuclear Magnetic Resonance Spectroscopy 1 or 2 Seminar, 1 hour; term paper, 0 or 3 hours. Prerequisite(s): graduate standing; consent of instructor. Focuses on various advanced methods for the determination of structure, dynamics, and interactions of biomolecules. Utilizes

multidimensional and multinuclear NMR spectroscopy. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

BIEN 267 Special Topics in Biophotonics 1 or 2 Seminar, 1 hour; term paper, 0 or 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on advanced science and technology methods that use electromagnetic radiation for medical and biological applications. Covers photonic devices, detection, microscopy and spectroscopy techniques, and diagnostics and mechanistic ideas on photodynamic therapy. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

BIEN 268 Bioengineering Experimentation and Analysis 2 Laboratory, 3 hours; discussion, 1 hour; written work, 2 hours. Prerequisite(s): BIOL 005C, CHEM 001C, CS 005, MATH 046, PHYS 002C or equivalents; graduate standing; or consent of instructor. Introduces measurement principles and data acquisition methods related to biomechanics and biochemical and bioelectrical signals from living systems. Addresses the fundamental mechanisms underlying the operation of various sensor types and the modern instruments illustrating noise analysis, filtering, signal processing, and conditioning. Includes experiments aimed at investigating physical responses of cells and tissues to a variety of stimuli.

BIEN 269 Special Topics in Optical Measurements and Photomedicine 2 Discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the applications of optical trapping methods to characterize the mechanical and electromechanical properties of biological cells and membranes, as well as to quantify molecular interactions. Also covers the use of optical probes for cellular and tissue imaging, as well as optical therapy. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes.

BIEN 270 Transport With Reactions in Biological Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 264 or equivalent; graduate standing or consent of instructor. For BIEN 270 online section; enrollment in the Online Master-in-Science in Engineering program. Covers the mathematical expression and modeling of principles underlying the transport processes of biological systems reactions and biomedical engineering processes involving reactions. Topics include advanced development of chemical kinetics and reaction mechanisms of biological systems; enzymatic reactions; Michaelis-Menton kinetics; and cell-surface ligand-receptor kinetics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BIEN 272 Special Topics in Biomaterials and Tissue Engineering 1 to 2 Seminar, 1 to 2 hours; term paper, 0 to 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on advanced biomaterials and tissue engineering for medical applications. Explores the design, processing, characterization, and evaluation of biomaterials. Examines current development in novel materials and recent advances in their applications in tissue engineering, drug delivery, gene therapy, cell therapy, medical devices, and implants. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes to a maximum of 30 units. Cross-listed with MSE 280.

BIEN 273 Special Topics in Regenerative Engineering and Biomechanics 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on advanced regenerative engineering and biomechanics in the skeletal system. Examines biomechanics of skeletal system at the tissue and cell levels utilizing molecular biology approaches. Develops and implements regenerative methodologies for repairing damaged skeletal tissues by a thorough understanding in mechanobiology. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 30 units.

BIEN 274 Special Topics in Endothelial Biomedicine 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Presents an integrated view of the fundamental role of endothelial cells in regulating vascular tone, inflammation, and repair in both health and disease. Encompasses the principles related to developmental biology, molecular and cellular biology, biomechanics, bioengineering, and translational medicine. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 30 units.

BIEN 275 Magnetic Resonance Imaging 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 111 with a grade of C- or better; or equivalent; graduate standing; or consent of instructor. Covers physics principles and engineering fundamentals, advanced techniques, and major biomedical approaches of magnetic resonance imaging (MRI). Focuses on fundamentals and general methodology of MRI. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BIEN 276 Intro to Neuroimaging With Mri 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Focuses on the use of magnetic resonance imaging (MRI) in the study of the brain. Topics include structural imaging, functional imaging, diffusion tensor imaging, and brain connectivity. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with PSYC 276.

BIEN 286 Colloquium in Bioengineering 1 Colloquium, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Colloquia on current research topics in bioengineering and other related fields. Presented by faculty members and visiting scientists. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BIEN 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor Faculty-directed individual study of selected topics in Bioengineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

BIEN 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Provides research opportunities for selected problems in bioengineering. Conducted under faculty supervision. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BIEN 298I Individual Internship 1 to 12 Internship, 2 to 24 hours; written work, 1 to 12 hours. Prerequisite(s): graduate standing; consent of instructor. An individual apprenticeship in bioengineering with an approved professional individual or organization and academic work under the direction of a faculty member. Requires a written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

BIEN 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing; consent of instructor. Designated for research in bioengineering for the M.S. thesis or Ph.D. dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Course

BIEN 302 Teaching Practicum 1 to 4 Practicum 3 To 12, Prerequisite(s): graduate standing; appointment as a teaching assistant or associate in Bioengineering Provides supervised teaching in undergraduate courses. Graded Satisfactory (S) or No Credit (NC).

BIEN 401 Fundamentals of Proposal Preparation and Ethical Standards in Bioengineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. An introduction to effective proposal preparation and writing for bioengineering-related research. Also covers ethical standards of scientific research related to bioengineering. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BIEN 402 Effective Writing For Bioengineering Research Publications 4 Lecture, 4 hours. Prerequisite(s): BIEN 401; graduate standing. An introduction to effective manuscript writing for bioengineering-related research publications.

Bioengineering Interdepartmental Graduate Program

Xiaoping Hu, Ph.D., Chair
Department Office, 203 MSE
(951) 827-2925; xiaoping.hu@ucr.edu
https://www.bioeng.ucr.edu/

Distinguished Professors

Michael E. Adams, Ph.D. (Entomology and Neuroscience)
Mark Alber, Ph.D. (Mathematics)
Bir Bhanu, Ph.D. (Electrical and Computer Engineering)
Sean Cutler, Ph.D. (Botany and Plant Sciences)
Tao Jiang, Ph.D. (Computer Science & Engineering)
David Lo, Ph.D. (Biomedical Sciences)
Ashok Mulchandani, Pd.D. (Chemical & Environmental Engineering)
Michael Pirrung, Ph.D. (Chemistry)
Kambiz Vafai, Ph.D. (Mechanical Engineering)
Charles Wyman, Ph.D. (Chemical & Environmental Engineering)

Professors

Bahman Anvari, Ph.D. (Bioengineering)
Christopher J. Bardeen, Ph.D. (Chemistry)
Devin K. Binder, Ph.D. (Biomedical Sciences, in Residence)
Richard Cardullo, Ph.D. (Evolution, Ecology, and Organismal Biology)
Q. Jason Cheng, Ph.D. (Chemistry)
Anupama Dahanukar, Ph.D. (Molecular, Cell, & Systems Biology)
Iryna Ethell, Ph.D. (Biomedical Sciences)
Byron Ford, Ph.D. (Biomedical Sciences, Adjunct)
Martín I. García-Castro, Ph.D. (Biomedical Sciences)
Thomas Girke, Ph.D. (Botany and Plant Sciences)
Xiaoping Hu, Ph.D. (Bioengineering)
Jiayu Liao, Ph.D. (Bioengineering)
Huinan H. Liu, Ph.D. (Bioengineering)
Stefano Lonardi, Ph.D. (Computer Science & Engineering)
Manuela Martins-Green, Ph.D. (Molecular, Cell, & Systems Biology)
Jin Nam, Ph.D. (Bioengineering)
Cengiz S. Ozkan, Ph.D. (Mechanical Engineering)
Mihri Ozkan, Ph.D. (Electrical and Computer Engineering)
Maurizio Pellecchia, Ph.D. (Biomedical Sciences)
Victor G.J. Rodgers, D.Sc. (Bioengineering)
Khaleel A. Razak, Ph.D. (Psychology)
Aaron Seitz, Ph.D. (Psychology)
Thomas F. Stahovich, Ph.D. (Mechanical Engineering)
Prue Talbot, Ph.D. (Molecular, Cell, & Systems Biology)
Seema K. Tiwari-Woodruff, Ph.D. (Biomedical Sciences)
Harry W. K. Tom, Ph.D. (Physics & Astronomy)
Valentine I. Vullev, Ph.D. (Bioengineering)
Ian R. Wheeldon, Ph.D. (Chemical and Environmental Engineering)
Jianzhong Wu, Ph.D. (Chemical & Environmental Engineering)
Nicole I. zur Nieden, Ph.D. (Molecular, Cell, & Systems Biology)

Professors Emeriti

Guillermo Aguilar, Ph.D. (Mechanical Engineering, Adjunct)
George J. Andersen, Ph.D. (Psychology)
David F. Bocian, Ph.D. (Chemistry)
Sarjeet S. Gill, Ph.D. (Molecular, Cell, & Systems Biology)
David A. Johnson, Ph.D. (Biomedical Sciences)
Cynthia K. Larive (Chemistry)
Eugene A. Nothnagel, Ph.D. (Botany and Plant Sciences)
Jerome S. Schultz, Ph.D. (Bioengineering)

Associate Professors

Nicholas V. DiPatrizio, Ph.D. (Biomedical Sciences)
William H. Grover, Ph.D. (Bioengineering)
Elaine Haberer, Ph.D. (Electrical and Computer Engineering)
Chung-Hao Lee, Ph.D. (Bioengineering)
Giulia Palermo, Ph.D. (Bioengineering)
B. Hyle Park, Ph.D. (Bioengineering)
Masaru P. Rao, Ph.D. (Mechanical Engineering)
Hideaki Tsutsui, Ph.D. (Mechanical Engineering)

Assistant Professors

Juhong Chen, Ph.D. (Bioengineering)
Vasileios Christopoulos, Ph.D. (Bioengineering)
Mona Eskandari, Ph.D. (Mechanical Engineering)
Kevin J. Freedman, Ph.D. (Bioengineering)
Jia Guo, Ph.D. (Bioengineering)
Elena Kokkoni, Ph.D. (Bioengineering)
Robert McKee, Ph.D. (Bioengineering, of Teaching)
Maria A. Ninova, Ph.D. (Biochemistry)
Joshua T. Morgan, Ph.D. (Bioengineering)
Iman Noshadi, Ph.D. (Bioengineering)
Tingting Xiang, Ph.D. (Bioengineering)
Hongdian Yang, Ph.D. (Molecular, Cell, & Systems Biology)

Program Overview

The Bioengineering Interdepartmental Graduate program (BIG) is the umbrella for graduate level research effort associated with the faculty in the Department of Bioengineering as well as other faculty at UCR who have an interest in training graduate students in bioengineering. The program offers graduate instruction leading to M.S. and Ph.D. degrees in Bioengineering.

Our interdisciplinary program combines a solid fundamental foundation in biological science and engineering, and aims to equip the students with diverse communication skills and training in the most advanced quantitative bioengineering research so that they can become leaders in their respective fields.

The result is a rigorous, but exceptionally interactive and welcoming educational training for Bioengineering graduate students.

The interdepartmental aspect of the program allows students to develop skills related to bioengineering with faculty in a broad range of disciplines. The research vision is to build strength from experts in biochemistry, biophysics, biology and engineering to focus on critical themes that impact bioengineering.

Contributing departments include: Bioengineering, Biochemistry, Biomedical Sciences, Botany & Plant Sciences, Cell Biology & Neuroscience, Chemistry, Chemical & Environmental Engineering, Computer Science, Electrical and Computer Engineering, Entomology, Mechanical Engineering, Physics & Astronomy, and Psychology.

The five research focus areas in the department are :

A. Biomaterials, regenerative medicine, and therapeutics
B. Biomedical imaging and instrumentation
C. Computational bioengineering
D. Neuroengineering and rehabilitation
E. Molecular and cellular engineering

Other research areas include: high-throughput screening systems, structural bioinformatics, microfluidics, charge transfer in biological and biomimetic systems, immunophysics, auditory bioengineering, molecular mechanisms of platelets activation, fatty acid contributions to obesity and diabetes, brain imaging, and bioseparations.

Please visit the UCR website to determine the research emphasis of the various participating faculty. The research efforts of faculty in the Department of Bioengineering can be found at https://www.bioeng.ucr.edu/.

Combined B.S. + M.S. Five-Year Program

The college offers a combined B.S. + M.S. program in Bioengineering designed to lead to a Bachelor of Science degree as well as a Master of Science degree in five years. Applicants for this program must have a high school GPA above 3.6, complete the Entry Level Writing Requirement before matriculation, and have sufficient mathematics preparation to enroll in calculus in their first quarter as freshmen.

Interested students who are entering their junior year should check with their academic advisor for information on eligibility and other details.

Students in the B.S. + M.S. program may use units from their last two technical electives from their undergraduate course work towards their M.S. degree in addition to their B.S. degree. Students may not choose which technical elective units they will use. Only the last two courses will count. To transfer the units to the M.S. degree, students must see the department to submit the proper paperwork.

Admission

In addition to the following requirements, all applicants must meet the general requirements as set forth in this catalog under the Graduate Studies section.

Application to the BIG program is limited to the fall quarter.

Applicants will need to have completed coursework in chemistry, physics, math, biochemistry and biology, and engineering. Students without an undergraduate engineering degree should have excellent training in mathematics and the physical sciences.

Specific requirements for students are:

- Two years of mathematics (equivalent UCR course = MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 031, MATH 045 or MATH 046).
- One year of physics (equivalent UCR

course = PHYS 002A, PHYS 002B, PHYS 002C with lab).

- One year of inorganic chemistry including lab (equivalent UCR course = CHEM 001A, CHEM 001B, CHEM 001C).
- One year of organic chemistry including lab (equivalent UCR course = CHEM 112A, CHEM 112B, CHEM 112C).
- One course in biochemistry (equivalent UCR course = BCH 100 or BCH 110A or BCH 110B or BCH 110C).
- One course in molecular biology (equivalent UCR course = BCH 110C or BIOL 107).

Students with strong academic records may be admitted with limited coursework deficiencies, provided that these are satisfied by appropriate coursework taken during the first two years of graduate study.

Students may be admitted to either the Master's or the Ph.D. program. Students in the Master's program may petition for admission into the Ph.D. program.

Master's Program

The M.S. program is ideal for professionals seeking greater depth in several areas of bioengineering. The degree requires a minimum of 36 quarter credits and may be completed in three to four academic quarters of full-time study. Both thesis and non-thesis options are offered for the degree program (Plan I, Thesis and Plan II, Comprehensive Examination).

Student must request permission to pursue an M.S. in Bioengineering while simultaneously pursing a Ph.D. in a program other than Bioengineering.

Normative Time to Degree Two years.

Plan I (Thesis)

In addition to the following requirements, all applicants must meet the requirements for Plan I as set forth in this catalog under the Graduate Studies section Master's Degree Plan I (Thesis).

Course Requirements
Students must satisfy the core course requirements (see Core Courses). Students must enroll in BIEN 286, Colloquium in Bioengineering, each quarter it is offered.

Plan II (Comprehensive Examination)

This plan is designed primarily for students who do not intend to pursue a Ph.D. in Bioengineering.

In addition to the following requirements, all applicants must meet the requirements for Plan I as set forth in this catalog under the Graduate Studies section Master's Degree Plan II (Comprehensive Examination).

Course Requirements
Students must satisfy the core course requirements (see Core Courses).

Comprehensive Examination
The comprehensive examination is prepared and administered by the Graduate Examination Committee. The student is allowed to choose between an oral and a written examination. The examination covers a broad range of topics chosen from upper division undergraduate courses and graduate courses taken by M.S. students.

Subsequent to the examination, the Graduate Examination Committee issues a passing or failing grade. Students who fail in the first attempt may retake the examination at the next scheduled comprehensive examination period. No more than two attempts to pass the exam are allowed.

The M.S. Comprehensive Examination may be held at the end of any quarters throughout the year. The committee to administer the M.S. Comprehensive Examination is selected by the Graduate Advisor and approved by the Graduate Program Committee.

Thesis and Defense
A written thesis is completed by each student.

Students are required to defend the thesis in a public, oral presentation at a time announced to members of the University community. The Defense can be completed in one of the following modes: In-Person or Hybrid. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. Students taking the exam in hybrid format are expected to present the exam on campus in a video-enabled room that supports some members physically present and others remote.

Doctoral Program

The Ph.D. program is heavily integrated with research activities and is intended for well-qualified individuals who wish to pursue leadership careers in academic or industrial research. The Ph.D. program requires approximately three years of full-time study beyond the master's degree. In consultation with a faculty advisor, Ph.D. students plan their program of study.

The doctoral dissertation is based on original research in the field of specialization. An M.S. degree is not a prerequisite for entering the Ph.D. program.

The doctoral program includes a teaching requirement, an oral and written qualifying examination, and a dissertation.

Normative Time to Degree Five years.

Course Requirements
Students must satisfy the core course requirements (see Core Courses).

Written Qualifying Examination
Students in the Ph.D. program must pass a written qualifying examination that covers the fields of engineering and biology that relate to the student's dissertation project.

Oral Qualifying Examination
Following successful completion of the written examination, candidates for the doctoral degree must pass an oral examination, normally within three quarters of the date of their written exam. The oral examination is scheduled only after the candidate has written a proposal detailing the rationale, specific aims and approaches to be undertaken for her/his dissertation research.

The Oral Qualifying Exam can be taken in one of the following modes: In-Person or Hybrid. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. Students taking the exam In-Person are expected to present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the exam in a video enabled room that supports some members physically present and others remote.

Dissertation
A written dissertation is completed by each student.

Candidates for the degree of Ph.D. may be required to defend the dissertation in a public, oral presentation at a time announced to members of the University community.

Final Defense
The Final Defense can be completed in one of the following modes: In-Person or Hybrid. Given the significance of the Final Defense, the In-Person mode should be considered whenever possible. However, the student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. Students defending In-Person are expected to present the Final Defense on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the exam in a video enabled room that supports some members physically present and others remote.

Core Courses
To ensure that graduate students in the Bioengineering program have advanced knowledge in mathematical, engineering, and biological principles that form the foundation for bioengineering, all M.S. and Ph.D. students are required to complete the following course program. Students who have completed these (or equivalent) courses elsewhere may petition to have partial waiver of course requirements or some of their units transferred (see the Graduate Division policy for transferring course units). Competency in these areas will be tested as part of the comprehensive exam for M.S. students and in the written preliminary examination for Ph.D. students.

The overall course curriculum includes courses in core bioengineering topics (3), mathematical and statistical methods (2), bioscience (1), general engineering (1), and professional development.

Bioengineering Topics

Every student must complete a program of study that includes:

Depth: 2 courses from one of 5 bioengineering research focus areas (listed in Program Overview) in order to increase the depth of knowledge in a bioengineering research specialty

Breadth: 1 course from one of the other bioengineering research focus areas to increase the student's breadth of knowledge.

The courses in each of the research focus areas are as follows:

A. Biomaterials, regenerative medicine, and therapeutics: BIEN 234, BIEN 235, BIEN 236
B. Biomedical imaging and instrumentation: BIEN 227, BIEN 242, BIEN 245, BIEN 275
C. Computational bioengineering: BIEN 223, BIEN 249, BIEN 264, BIEN 270

D. Neuroengineering and rehabilitation: BIEN 275, BIEN 276

E. Molecular and cellular engineering: BIEN 224, BIEN 225

A single course can be used to satisfy either the depth or breadth requirement, but not both.

Mathematical and statistical methods
All graduate students must complete the following two courses in order to reach graduate-level mastery of mathematical and statistical methods used in bioengineering: BIEN 201, BIEN 211.

Bioscience coursework
All graduate students must complete one graduate-level bioscience class chosen from: BCH 210, BCH 211, BCH 212, BIOL/CMDB 200, BIOL/CMDB 201, BIOL 203, BIOL 221/MCBL 221/PLPA 226, NRSC 200A, CMDB 207.

Engineering coursework
All graduate students must complete one graduate-level course in a more traditional engineering topic from the following list: BIEN 242, BIEN 245, BIEN 264, BIEN 270, BIEN 275, CEE 238A, CEE 210, CEE 212, EE 206, EE 217, EE 233, EE 237, EE 240, EE 241, EE 243, EE 244, ME 220, ME 240A, ME 241A, ME 261, ME 266, ME 267, ME 270, ME 271, ME 272, MSE 208A, MSE 208B, MSE 227A, MSE 238.

The course used to fulfill this requirement should be closely connected to the courses chosen for the student's chosen primary bioengineering research focus area.

Bioengineering coursework used to satisfy the Engineering requirement cannot be used toward the Depth or Breadth requirements for Bioengineering coursework.

Professional development training
All graduate students must complete professional development through the following mechanisms:

A. **BIEN 286**. This course is required every quarter in which it is offered.

B. **BIEN 401**. Ph.D. students must enroll in this course before attempting their Oral Qualifying Examination.

C. **BIEN 402**. M.S. students must enroll in this course during their first year; Ph.D. students must enroll in the course before attempting their Oral Qualifying Examination.

Substitutions or other alterations to the overall course requirements require approval from the Bioengineering Graduate Advisor.

Other courses may be substituted but must be approved by the Bioengineering Graduate Advisor.

Additional courses may be required by the Advisory Committee depending on the student's background and fields of interest.

With the exception of BIEN 401 and 402 for Ph.D. students, graduate students are expected to complete course requirements for the programs within their first year of residence. Exceptions to this timeline require approval from the Bioengineering Graduate Advisor.

Course Descriptions All Bioengineering courses are listed and described under Bioengineering.

Biological Sciences

Subject abbreviation: BLSC
College of Natural and Agricultural Sciences

The Biological Sciences interdepartmental major is not currently accepting new students. For more information, contact CNAS Undergraduate Academic Advising Center, 1223 Pierce Hall, (951) 827-7294.

Biology

Subject abbreviation: BIOL
College of Natural and Agricultural Sciences

Joel L. Sachs, Ph.D., Department Chair
Department Office, Boyce Hall 5406
(951) 827-6357; eeob.ucr.edu

Professors
Kurt Anderson, Ph.D.
Theodore Garland, Jr., Ph.D. *Distinguished Professor*
Kimberly A. Hammond, Ph.D.
Timothy E. Higham, Ph.D.
Helen M. Regan, Ph.D.
David N. Reznick, Ph.D. *Distinguished Professor*
Joel L. Sachs, Ph.D.
Wendy G. Saltzman, Ph.D.

Professors Emeriti
Michael F. Allen, Ph.D.
Richard A. Cardullo, Ph.D. (Professor of the Graduate Division)
Mark A. Chappell, Ph.D.
Daphne Fairbairn, Ph.D.
Roger D. Farley, Ph.D.
Leah T. Haimo, Ph.D.
Bradley C. Hyman, Ph.D.
Leonard P. Nunney, Ph.D. (Professor of the Graduate Division)
Edward G. Platzer, Ph.D. (Biology/Nematology)
Mary V. Price, Ph.D.
Derek A. Roff, Ph.D. *Distinguished Professor*
John T. Rotenberry, Ph.D.
Clay A. Sassaman, Ph.D.
Mark S. Springer, Ph.D. *Distinguished Professor*
Nickolas M. Waser, Ph.D.

Associate Professors
Alan Brelsford, Ph.D.
Polly Campbell, Ph.D.
Christopher Clark, Ph.D.
Marko Spasojevic, Ph.D.

Assistant Professors
Ellie Armstrong, Ph. D.
Elisa Cabrera Guzman, Ph.D.
Laura Cantano, Ph.D.
Lucy Delaney, Ph.D.
Natalie Holt, Ph.D.
Daniel Moen, Ph.D.
Kate Ostevik, Ph.D.
Kieran Samuk, Ph.D.
Meredith VanAcker, Ph.D.
Shana Wells, Ph.D.

Adjunct Faculty
John Gatesy, Ph.D.
Cheryl Y. Hayashi, Ph.D.
Tracy L. Kahn, Ph.D.
Marlene Zuk, Ph.D.

Cooperating Faculty
Khaleel Abdulrazak (Psychology)
Christopher Cantano (Botany and Plant Sciences)
Matthew Daugherty (Entomology)
Erica Heinrich (SOM)
Darrel Jenerette, Ph.D. (Botany and Plant Sciences)
Daniel Koenig (Botany and Plant Sciences)
Loralee Larios, Ph.D. (Botany and Plant Sciences)
Amy Litt, Ph.D. (Botany and Plant Sciences)
Jessica Purcell, Ph.D. (Entomology)
Erin Rankin, Ph.D. (Entomology)
Louis Santiago, Ph.D. (Botany and Plant Sciences)
Jason Stajich, Ph.D. (Microbiology and Plant Pathology)

Major

The Department of Evolution, Ecology, and Organismal Biology offers B.A. and B.S. degrees in Biology. Both programs are based on the conviction that broad undergraduate training in biology, mathematics and the physical sciences, together with study in the humanities and social sciences, are fundamental to the education of a biologist. In addition to English composition, humanities, social sciences and the Biology core curriculum (see below, Major Requirements), both degrees require 36 units of upper-division (numbered 100-199) biology courses. The degrees differ in the humanities and social sciences requirements; also 16 units of a foreign language are required for the B.A., whereas the B.S. requires 16 additional units in substantive courses in biology or related fields.

The research and teaching of the Department of Evolution, Ecology, and Organismal Biology includes different levels (e.g., molecules, cells, organisms, populations, communities) and processes (e.g., development, evolution) of biological organization. An overview is presented in the introductory courses (BIOL 005A, BIOL 05LA, BIOL 005B, and BIOL 005C), and emphasis is placed on the unifying principles of the discipline.

Because of the diversity within biology and the wide range of career options, much latitude is allowed in selecting upper-division biology courses for the 36 units required for the major. Each student can select courses and plan a program of study to meet their specific interests and career goals. For assistance with this, faculty advisors are available in The Department of Evolution, Ecology, and Organismal Biology. The section below, Programs of Specialization, is provided as a guide for course selection for graduate schools, medical and health science professional schools and the broad range of careers that are possible with the Biology major.

The 36 upper-division units are selected from a list which includes courses offered by the Department of Evolution, Ecology, and Organismal Biology (BIOL 100-199) and a limited number of courses in Biochemistry (BCH), and Cell Biology and Neuroscience (CBNS). Qualified undergraduates (GPA 3.0 or above) may participate in graduate-level biology seminar

courses with consent of the instructor, and up to 4 units (with letter grade) may be included in the major.

Those who choose to obtain a B.S. degree have as a college requirement an additional 16 units in upper-division biology courses and/or substantive courses in a field or fields related to the major. The purpose of this related area is to add strength and breadth to the major and to meet specific requirements for postgraduate study or a chosen career. The substantive courses in fields related to the major must be from the approved list or approved by an advisor and may be lower or upper division, but they usually have science or mathematics prerequisites (e.g., CBNS 120/PSYC 120, CHEM 005, STAT 011, MATH 009C).

The Thomas Haider Program at the UCR School of Medicine

Students in the Biology major and all others at UCR are eligible to complete admission requirements and apply for up to 24 positions reserved for UCR students in the UCR School of Medicine. Students eligible to apply to this unique pathway into the UCR medical school, called the Thomas Haider Program at the UCR School of Medicine, are those who attend UCR for at least six consecutive quarters and complete their bachelor's degree at UCR. Information on this program and general admission to the UCR medical school is provided at medschool.ucr.edu, in the school's section of this catalog, in the medical school Student Affairs Office [1682A School of Medicine Education Building, (951) 827-4334], and at orientation meetings held at UCR.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Major Requirements

Some of the following requirements for the major in Biology may also fulfill the College's breadth requirements. Consult with an academic advisor for course planning.

1. **Biology core curriculum (64-68 units)**
   a) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C
   b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
   c) CHEM 008A or CHEM 08HA, CHEM 08LA or CHEM 8HLA, CHEM 008B or CHEM 08HB, CHEM 08LB or CHEM 8HLB
   d) MATH 007A or MATH 009A, MATH 09HA, MATH 007B or MATH 009B or MATH 09HB
   e) PHYS 002A or PHYS 002HA, PHYS 002B or PHYS 002HB, PHYS 002C or PHYS 002HC, PHYS 02LA or PHYS 02HLA, PHYS 02LB or PHYS 02HLB, PHYS 02LC or PHYS 02HLC
   f) STAT 010
   g) BCH 100 or BCH 100H or BCH 110A or BCH 110HA

The Biology core curriculum must be completed with a grade point average of 2.0 or better and no grade lower than "C-." If a grade of D or F is received in two core curriculum courses, either in separate courses or repetitions of the same course, the student will not be permitted to continue in the major.

2. **Upper-division requirements (36 units)**
   a) BIOL 102
   b) Thirty-two (32) additional upper-division units in Biology and other courses to be taken in consultation with an advisor.
3. **Other requirements**

   Note: Students are strongly urged to take the Biology Core Curriculum in the first two years of university study. Students intending to pursue the health professions are urged to familiarize themselves with the course requirements of their desired professional school(s) and should work with the advisor at the Pre-Professional Advising Center (PPAC) in planning their programs.

For the Bachelor of Arts only (0-16 units): The foreign language requirement may be fulfilled by completing level four or the demonstration of equivalent proficiency in one foreign language.

For the Bachelor of Science only (16 units): An additional 16 units in upper-division biology courses and/or substantive courses in a field or fields related to the major. A list of acceptable courses is available in the CNAS Academic Advising Center.

Programs of Specialization

The Life Sciences core curriculum (item 1 above) fulfills many of the requirements for admission to graduate schools in biology or professional schools in the medical and health science fields. In addition to Introductory Genetics (BIOL 102, 4 units), a wide choice is available for the remaining 32 upper-division units required for the Biology major (item 2.b) above) and the 16 additional units related to the field of the major (B.S. degree, item 3 above). Each student selects upper-division and related courses depending on the type of school and career chosen (e.g., education, research, medicine, pharmacy, dentistry, optometry, veterinary medicine, nursing, physical therapy, public health, graduate school in one of the fields below).

In planning an academic program to prepare for teaching, research, or one of the medical fields, additional information about required course work and admission tests (MCAT, OAT, VCAT, PCAT, GRE) can be obtained from the Career Center and the Pre-Professional Advising Center (visit careers.ucr.edu or ppac.ucr.edu).

Suggested courses of study are provided below for those interested in various biological fields. These programs meet most of the requirements for admission to corresponding graduate schools for those students who wish to pursue a master's and/or Ph.D. degree. The faculty advisor assists in selecting combinations of courses appropriate for advanced study in the fields below and others. Students considering graduate study are encouraged to do undergraduate research and take courses in computer science and statistics.

In some cases, a course of study differing substantially from the examples given below will best meet the needs of the student. In consultation with a faculty advisor, a student may prepare a program in some other biological specialization such as animal behavior, evolution/development or developmental biology.

Cell and Molecular Biology

BIOL 102, BIOL 105, BIOL 107A, BIOL 107B, CBNS 101 or BIOL 113 and BIOL 114, BIOL 119, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 122/MCBL 122, BIOL 123/MCBL 123/PLPA 123, BIOL 124/MCBL 124, BIOL 128/CBNS 128, BIOL 155/BPSC 155, BIOL 168, BCH 100/BCH 100H or the BCH 110A/BCH 110HA, BCH 110B/BCH 110HB, and BCH 110C/BCH 110HC sequence, CBNS 108, CBNS 150/ENTX 150, CHEM 005, CHEM 109, STAT 011

Ecology and Population Biology

BIOL 102, BIOL 104/BPSC 104, BIOL 105, BIOL 108, BIOL 116, BIOL 117, BIOL 160, BIOL 160L, BIOL 174, either BIOL 175 or BIOL 143/BPSC 143, BIO 127/ENTM 127, the MATH 007A or MATH 009A, MATH 007B or MATH 009B, and MATH 009C sequence, STAT 011

Also recommended: BIOL 146/BPSC 146, BIOL 151, BIO 161A, BIOL 163, BIOL 165/BPSC 165, BIOL 166, BIOL 169, BIOL 170, MATH 046

Molecular Genetics

BIOL 102, BIOL 105, BIOL 107A, BIOL 107B, BIOL 108, BIOL 115, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 122/MCBL 122, BIOL 123/MCBL 123/PLPA 123, BIOL 128/CBNS 128, BIOL 155/BPSC 155, BIOL 168, CBNS 108, CBNS 150/ENTX 150, CBNS 169

Zoology and Physiology

BIOL 100/ENTM 100, BIOL 102, BIOL 105, CBNS 101 or BIOL 113 and BIOL 114, BIOL 151, BIOL 152/GEO 152, BIOL 157, BIOL 159, BIOL 160, BIOL 160L, BIOL 161A, BIOL 161B, BIOL 162/ENTM 162, BIOL 163, BIOL 168, BIOL 169, BIOL 170, BIOL 171A, BIOL 171B, BIOL 171C, BIOL 172, BIOL 173/ENTM 173, BIOL 174, BIOL 175, BIOL 178, BCH 100, CBNS 106, CBNS 108, CBNS 116, CBNS 169. Students are also encouraged to take laboratory courses. Also recommended: a course in ecology (e.g., BIOL 116), STAT 011

California Teach-Science and Mathematics Initiative (CalTeach-SMI)

California Teach-Science and Mathematics Initiative (CalTeach-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CalTeach-SMI at UCR offers undergraduate students paid/unpaid opportunities, such as the Scholar Apprentice Program, to explore STEM teaching as a career option. Through CalTeach-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The

CalTeach-SMI Resource Center provides future STEM teachers with material and financial resources to promote planning and professional development towards a science/mathematics education career.

For more information about the CalTeach-SMI program, please visit smi.ucr.edu, the Resource Center at 1114 Pierce Hall, or on Facebook at facebook.com/ScienceMathInitiativeAtUcr and on Instagram at instagram.com/smiatucr/.

Additional Curricular and Advising Information

This catalog has sections applicable for all students at UCR (Finances and Registration, Academic Regulations), and a specific section for students in this college (College of Natural and Agricultural Sciences). Present and prospective students are referred to those sections for enrollment policies and procedures and curricular and advising information for the campus and college.

For Biology majors, information regarding the following topics can be obtained from the CNAS Undergraduate Academic Advising Center in 1223 Pierce Hall:

- Student Academic Advising
- Grading Basis: Letter Grade or S/NC
- Full or Part-time Study
- Transfer Students
- Minor
- Double Major
- Internships
- Preparation for Graduate School
- Education and Research Centers, Institutes and Resources

Independent Study and Research

The Department of Evolution, Ecology, and Organismal Biology offers courses in which students can enroll to do independent laboratory research or an in-depth library study of a topic of special interest.

Students desiring to do Independent Reading (BIOL 194), Introduction to Research (BIOL 197) or Junior/Senior Research (BIOL 199) should consult with a professor who is willing to supervise the project. The student may suggest a specific question or formulate a project after consultation with the instructor. Information about the research fields of the professors is available on the Department of Evolution, Ecology, and Organismal Biology website.

To enroll in these Independent Study and Research courses, students must first contact the associated instructor for approval and proceed with enrolling through the CNAS Enrollment Management Center (1140F Batchelor Hall/ cnasemc.ucr.edu); preferably before the first day of instruction but no later than the end of the second week of the quarter.

Applicants for BIOL 194 and BIOL 199 should ordinarily be juniors or seniors with a GPA of 3.00 or higher. Sophomore students with a GPA of 3.00 or higher may apply to enroll in BIOL 197 (Introduction to Research), since the purpose of this course is to enable the student to do preliminary reading and laboratory research to explore with the professor the feasibility of undertaking a project for later enrollment in BIOL 199. Enrollment in BIOL 197 is not required before enrollment in BIOL 199, but the former course is available for those situations where preliminary work will be helpful.

For BIOL 194 and BIOL 199, the student writes a report of the library study or laboratory results for the quarter, which is reviewed and submitted to the sponsoring professor by the last day of instruction of the quarter.

Students may also receive credit toward the major for independent study or research performed in other departments, with the approval of the Lead Faculty Advisor.

BIOL 194, BIOL 197, and BIOL 199 are graded "S/NC", and up to 9 units of credit may be counted as part of the 16 substantive units related to the major for the B.S. degree.

Natural Reserve System

This system was formed by the UC in 1965 to preserve for study a series of undisturbed natural areas representing the state's vast ecological diversity. Since then the system has grown to include thirty-seven reserves, eight of them administered by the UCR campus. See Research Opportunities in this catalog.

Most of the reserves are undeveloped except for fencing, roads and trails, but laboratory facilities, housing and campgrounds for class use are available at some sites. The reserves are used as outdoor classrooms and laboratories by students, teachers and researchers from educational institutions, public and private, throughout the state, across the nation and around the world. Some of the courses offered by the UCR Department of Evolution, Ecology, and Organismal Biology include field trips and overnight camping trips to the reserves. In the field, students are introduced to the great diversity of plant and animal organisms in Southern California, and to the effect of environmental factors on this diversity.

Undergraduate and graduate students who wish to use the reserves in their individual research projects should contact Dr. Kim Hammond, Department of Evolution, Ecology, and Organismal Biology, 3318 Spieth Hall, khammond@ucr.edu, to obtain an application, map and list of rules and regulations.

Graduate Program

The Department of Evolution, Ecology, and Organismal Biology administers programs leading to the M.S. and Ph.D. degrees in Evolution, Ecology, and Organismal Biology. Applicants are strongly advised to contact potential faculty advisors prior to applying to the program. The GRE is not required or considered.

All graduate students entering the department meet with a guidance committee during the first quarter of enrollment so that their educational background can be addressed. Considering the requirements of the student's specialization, the committee recommends a program of study to be followed in pursuit of graduate work. Because of the diversity among the specializations, course requirements for advanced degrees are specified by the student's guidance committee.

Doctoral Degree

The Department of Evolution, Ecology, and Organismal Biology offers the Ph.D. degree in Evolution, Ecology, and Organismal Biology. In addition to the general requirements of the Graduate Division, students intending to become candidates for the Ph.D. degree in Evolution, Ecology, and Organismal Biology must complete the following:

Course Work
Course requirements are determined in consideration of the requirements of the student's area of specialization. Selection of specific courses is done by the guidance committee in consultation with the student.

All students are required to take EEOB 400, EEOB 210, EEOB 211, and EEOB 216. Students are also required to take two courses on current research topics (BIOL 252 or another disciplinary colloquium and EEOB 265) for a minimum of 5 quarters of each prior to advancement to candidacy and 12 quarters of each prior to completion of the doctoral degree.

Professional Development
One unit of coursework in professional development, which is satisfied by EEOB 400.

Written and Oral Qualifying Examinations
Students must pass a Written Examination in their specialized field of interest before taking their Oral Qualifying Examination. Written Qualifying Examinations must be completed by the eighth week of the sixth quarter in residence. Upon successful completion of the Written Qualifying Examination, an Oral Qualifying Examination is administered wherein students defend their dissertation proposal in person with their committee. However, the student may submit a request to their graduate advisor for an exception for a hybrid defense wherein they and/or any number of their committee members may attend virtually. If approved, the student is responsible for coordinating the virtual meeting spaces.

Dissertation Candidates may be required to successfully defend their dissertation research in a public oral presentation. Students defend their dissertation in person with their committee. However, the student may submit a request to their graduate advisor for an exception for a hybrid defense wherein they and/or any number of their committee members may attend virtually. If approved, the student is responsible for coordinating the virtual meeting spaces.

Teaching Requirements All students are required to serve as a Teaching Assistant for at least three quarters.

Normative Time to Degree 18 quarters

Master's Degree

The Department offers the M.S. degree in Evolution, Ecology, and Organismal Biology. To qualify for the M.S. degree, candidates must meet the following requirements:

Plan I (Thesis)
Thirty-six (36) quarter units of approved courses in the 100 or 200 series, of which at least 24 units must be in the 200 series courses in the biological sciences. Not more than 12 units of EEOB 299 may be applied to the degree. A minimum of 12 units of course work other than courses in the 290 series must be completed in fulfillment of the requirement for 24 units of graduate courses. Students must present an acceptable thesis and undergo a final oral examination in person with their committee in defense of the thesis. However, the student may submit a request to their graduate advisor for an exception for a hybrid defense wherein they and/or any number of their committee members may attend virtually. If approved, the student is responsible for coordinating the virtual meeting spaces.

Joint Doctoral Program with SDSU

The Department of Evolution, Ecology, and Organismal Biology at UCR along with the Department of Evolutionary Biology at San Diego State University (SDSU) administers a program leading to the Ph.D. degree in Evolutionary Biology, referred to as the Joint Doctoral Program in Evolutionary Biology (JDEB).

Admission
Applicants for admission to the JDEB will apply to the SDSU-UCR JDEB which will be coordinated by SDSU. Potential applicants should have a bachelor's degree in one of the life sciences or physical sciences. Promising students with other academic backgrounds are also encouraged to apply if they have strong undergraduate coursework in biology. Applicants must have a bachelor's and/or master's degree from an accredited institution.

At the start of the student's first year in the program, the student will form a Guidance Committee. This committee will consist of four faculty members, two chosen from each institution. From SDSU, the committee must include the student's prospective dissertation advisor and an additional, programmatically appropriate, member. From UCR, the committee members will be drawn from faculty within the EEOB graduate program. In consultation with the student, the Guidance Committee plans the student's program through Advancement to Candidacy.

Doctoral Degree

The Department of Evolution, Ecology, and Organismal Biology at UCR along with the Department of Evolutionary Biology at San Diego State University (SDSU) offers the Ph.D. degree in Evolutionary Biology after completion of the following degree requirements:

Specific fields of emphasis
This program emphasizes evolutionary biology; there are no specific emphases within the program, although research specialties may be quite diverse.

Course requirements
The Guidance Committee works with the student to develop an individualized course of study and identify potential deficiencies. Students in the joint doctoral program will have similar requirements as students in UCR's EEOB graduate program. Year 1 is spent at SDSU, year 2 is spent at UCR. Specifically, the joint doctoral students will take the Theory of Evolution (UCR EEOB 216) and at least two courses from the approved list below. One of these courses must be taken at UCR.

SDSU: BIOL 740 or BIOL 624

UCR: EEOB 210, EEOB 211, EEOB 212, EEOB 213, EEOB 214, EEOB 217, EEOB 219 or EEOB 220

In addition, the students will enroll in a current research topics seminar course during each UCR quarter (BIOL 252 or another disciplinary colloquium and EEOB 265) or SDSU semester (BIOL 795) of residence. The majority of required course work should be completed prior to the Written Qualifying Exam, which is taken at the end of the second year. All required disciplinary courses must be completed before taking the Oral Qualifying Exam.

Professional Development
One unit of coursework in professional development, which is satisfied by EEOB 400.

Written Qualifying Exam
By the end of the second year, students are expected to have taken a written qualifying examination. The Written Exam consists of a dissertation proposal that includes a synthetic review of the intended topic of the dissertation. The written exam is evaluated by the student's Oral Qualifying Exam Committee (see Oral Qualifying Exam below).

Oral Qualifying Exam
Upon passing the written exam, the student (in consultation with their SDSU and UCR coadvisors) selects an Oral Qualifying Exam Committee. This committee normally consists of five faculty members: a minimum of 2 UCR EEOB faculty, a UCR outside committee member, and a minimum of 2 SDSU EB faculty. During the exam, the candidate must defend the research proposal in person with their committee and may be questioned on other topics by the Oral Qualifying Exam Committee. The student may submit a request to their graduate advisor for an exception for a hybrid defense wherein they and/or any number of their committee members may attend virtually. If approved, the student is responsible for coordinating the virtual meeting spaces. Normally the Oral Qualifying Exam occurs in the Fall term of the student's third year.

Dissertation
Upon completion of the dissertation, the student will present a research seminar at SDSU. The research seminar will be followed by a final oral defense to be administered by the Dissertation Committee. The student and all committee members must be present in person. However, the student may submit a request to their graduate advisor for an exception for a hybrid defense wherein they and/or any number of their committee members may attend virtually. If approved, the student is responsible for coordinating the virtual meeting spaces. The completed dissertation must be formatted in accordance with the requirements currently in force at UCR. The dissertation is then filed at both UCR and SDSU.

Teaching Requirement
All JDEB students are required to serve as a Graduate Teaching Assistant for at least two semesters at SDSU.

Normative Time to Degree
18 Quarters/12 Semesters (6 years)

Lower-Division Courses

BIOL 002 Cellular Basis of Life 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. An introduction to the fundamentals of life processes at the cellular level. Topics include cell structure, chemical composition, metabolism, reproduction, genetics, and development with emphasis on humans. Not recommended for natural science majors. Either BIOL 002 or BIOL 003 may be taken as a breadth requirement in biology; together they provide a general introduction to the field of biology. Credit is not awarded for BIOL 002 if it has already been awarded for BIOL 005A, BIOL 05LA or BIOL 020.

BIOL 003 Organisms in Their Environment 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. An introduction to the physiology, ecology, and evolution of living organisms with emphasis on humans. Not recommended for natural science majors. Either BIOL 002 or BIOL 003 may be taken as a breadth requirement in biology; together they provide a general introduction to the field of biology. Credit is not awarded for BIOL 003 if it has already been awarded for BIOL 005B.

BIOL 005A Introduction to Cell and Molecular Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 05LA with a grade of C- or better, may be taken concurrently or BIOL 020 with a grade of C- or better, may be taken concurrently; CHEM 001A with a grade of C- or better, may be taken concurrently, CHEM 01LA with a grade of C- or better, may be taken concurrently or CHEM 01HA with a grade of C- or better, may be taken concurrently, CHEM 1HLA with a grade of C- or better, may be taken concurrently or CHEM 002A with a grade of C- or better, may be taken concurrently, CHEM 02LA with a grade of C- or better, may be taken concurrently. An intensive course designed to prepare for upper-division courses in cell and molecular biology. Covers biochemical, structural, metabolic, and genetic aspects of cells. Required for Biology majors; recommended for science majors desiring an introduction to biology.

BIOL 005B Introduction to Organismal Biology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A with a grade of C- or better; BIOL 05LA with a grade of C- or better or BIOL 020 with a grade of C- or better; CHEM 001A, CHEM 01LA or CHEM 01HA, CHEM 1HLA or CHEM 002A, CHEM 02LA; CHEM 001B, may be taken concurrently, CHEM 01LB, may be taken concurrently or CHEM 01HB, may be taken concurrently, CHEM 1HLB, may

be taken concurrently or CHEM 002B, may be taken concurrently, CHEM 02LB, may be taken concurrently. An intensive course designed to prepare for upper-division courses in organismal biology. Covers developmental biology, physiology, and regulation at the level of the organism. Required for Biology majors; recommended for science majors desiring an introduction to biology.

BIOL 005C Introductory Evolution and Ecology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A with a grade of C- or better; BIOL 05LA with a grade of C- or better or BIOL 020 with a grade of C- or better; BIOL 005B with a grade of C- or better; MATH 009A with a grade of C- or better or MATH 09HA with a grade of C- or better or MATH 007A with a grade of C- or better; CHEM 001C, may be taken concurrently, CHEM 01LC, may be taken concurrently or CHEM 01HC, may be taken concurrently, CHEM 1HLC, may be taken concurrently or CHEM 002C, may be taken concurrently, CHEM 02LC, may be taken concurrently. An intensive introduction to the subjects of evolution and ecology. Covers population dynamics, community ecology, population genetics, and evolutionary theory. Recommended for science majors desiring an introduction to biology. Students who take equivalent first-year biology at another institution may enter directly into BIOL 005C without critical handicap.

BIOL 05LA Introduction to Cell and Molecular Biology Laboratory 1 Laboratory, 3 hours. Prerequisite(s): BIOL 005A (may be taken concurrently); consent of instructor is required for students repeating the course. An introduction to laboratory exercises on fundamental principles of and techniques in cell and molecular biology. Illustrates the experimental foundations of the topics covered in BIOL 005A. Credit is awarded for only one of BIOL 020 or BIOL 05LA.

BIOL 010 Headlines in the History of Life 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. Explores the evolution of life beginning with precellular life. Topics include the origin of sex, multicellularity, vertebrate classes, morphological specializations, adaptive radiations, extinction dynamics, and the biology of dinosaurs. Cross-listed with GEO 003.

BIOL 020 Dynamic Genome 2 Laboratory, 6 hours. Prerequisite(s): CHEM 001A with a grade of C- or better, may be taken concurrently, CHEM 01LA with a grade of C- or better, may be taken concurrently or CHEM 01HA with a grade of C- or better, may be taken concurrently, CHEM 1HLA with a grade of C- or better, may be taken concurrently or CHEM 002A with a grade of C- or better, may be taken concurrently, CHEM 02LA with a grade of C- or better, may be taken concurrently; MATH 009A, may be taken concurrently or MATH 09HA, may be taken concurrently or MATH 007A, may be taken concurrently; restricted to class level standing of freshman. Introduces computational and experimental approaches in investigating the genomes of plants and animals. Explores scientific discovery using the tools of bioinformatics and genomics. Includes participation in research projects being conducted on campus. Credit is awarded for one of the following BIOL 020 or BIOL 05LA.

BIOL 030 Human Reproduction and Sexual Behavior 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A consideration of human anatomy, physiology and behavior as related to sexual reproduction, including discussion of fertility, pregnancy, childbirth and birth control. Consideration will also be given to homosexuality, venereal diseases, sex education, sexual intercourse and response.

BIOL 034 Human Heredity and Evolution 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Designed for both nonscience and science majors. Covers basic human genetics and evolution, and explores their relationship to physical and mental health. An exploration of the political, societal, and ethical implications of human heredity and evolution.

BIOL 040 Disease and History: From the Bubonic Plague to Aids 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. This lecture course for non-science majors will deal with the natural history of infectious diseases and how plagues have influenced the course of human history. It will cover the biology, pathology, epidemiology, and immunology of viruses, bacteria, and protozoan parasites causing smallpox, yellow fever, influenza, AIDS, syphilis, bubonic plague, tuberculosis, leprosy, malaria, and African sleeping sickness. The role of scientific inquiry in the conquest of human disease will be emphasized.

Upper-Division Courses

BIOL 100 General Entomology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C with a grade of C- or better; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introductory study of insects, Earth's most diverse group of animals (75 percent of animal species are insects). Covers the anatomy, physiology, ecology, behavior, and diversity of insects. Focuses on insect identification. Cross-listed with ENTM 100.

BIOL 101 Computational & Data Skills For Everyday Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, STAT 008 or STAT 010 or STAT 011. Covers computational and data skills required for modern biological data analysis using R. Topics include R Markdown for reproducible reports; data cleaning, manipulation and visualization; digitizing morphological data; analyzing messy datasets common across biology; mapping species ranges and temporal data; building phylogenies; and interacting with biological databases using APIs.

BIOL 102 Introductory Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 020 or BIOL 05LA, and BIOL 005B with grades of "C-" or better. An introductory course that includes classical Mendelian genetics, linkage and recombination, sex-linked traits, cytogenetics, developmental genetics, and molecular genetics. Also includes some probability theory and statistics.

BIOL 104 Foundations of Plant Biology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C. A study of the plant world from cells to ecosystems. Examines the structure and function of organisms from the major plant groups and their role in the biosphere. The laboratory explores the unique properties of plants. Cross-listed with BPSC 104.

BIOL 105 Evolution 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C with a grade of C- or better; BIOL 102; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C, PHYS 02LC or PHYS 02HC, PHYS 02HLC; STAT 010. Covers the causal interpretation of organic diversity and adaptation. Topics include inference of evolutionary change from the fossil record and from genomic and molecular patterns; microevolution and macroevolution; systematics and the species problem; and natural selection, drift, and other forces of evolution.

BIOL 106 Biology of Human Variation 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102; BIOL 105 or BIOL 108; STAT 011, may be taken concurrently; or consent of instructor. A survey of variation within and among contemporary human populations arising from genetic and environmental factors. Covers single-locus and polygenic inheritance, developmental plasticity, and physiological acclimatization. Includes biogeographic and demographic influences; variation in pigmentation, stature, physiology, disease susceptibility, behavior, and IQ; and critical evaluation of racial and ethnic classifications.

BIOL 107A Molecular Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; MATH 007B or MATH 009B or MATH 09HB ; PHYS 002C, PHYS 02LC or PHYS 02HC, PHYS 02HLC. Studies the structure and function of the genetic material including DNA structure, DNA replication and recombination, regulation of gene expression, and protein synthesis. Examines both prokaryotic and eukaryotic systems including contemporary recombinant DNA technology and applications of molecular cloning procedures. Credit is not awarded for BIOL 107A if it has already been awarded for BCH 110C.

BIOL 107B Advanced Molecular Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 107A or BCH 110C or BCH 110HC. An advanced treatment of the functional architecture of genetic material. Topics include genome structure and chromosome organization, DNA replication and gene expression, cloning organisms, molecular medicine, protein engineering, and application of modern molecular biology to agricultural problems. Topics include discussion of the impact of the emergent molecular technology on society.

BIOL 108 Population Genetics and Genomics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C, PHYS 02LC or PHYS 02HC, PHYS 02HLC; STAT 010. Studies factors influencing genomic variation in biological populations. Includes the effects of natural selection and genetic drift on genetic variation; detecting adaptive change from genomic data; why genetic diseases and cancers persist; evolution of co-operation; adaptation to pathogens and a changing environment; and how small, conserved populations face genetic challenges

BIOL 110 Biology of Human Problems 4 Seminar, 4 hours. Prerequisite(s): BIOL 005C; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; STAT 010. Studies selected human problems that have a large biological component and relate to medicine, ethics, and human existence. Topics include issues of major bioethical importance such as euthanasia, national health care, effects of industrial pollution on individuals and communities, population problems, abortion, and genetic engineering.

BIOL 111 Infectious Disease Epidemiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A with a grade of C- or better, BIOL 005B with a grade of C- or better, BIOL 005C with a grade of C- or better; BIOL 102 with a grade of C- or better; STAT 010 with a grade of C- or better. Introduces epidemiological methods used to investigate infectious diseases. Includes examples and case studies presented for a variety of human infectious diseases.

BIOL 112 Systematics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C or equivalent. Principles and philosophy of classification: phylogenetic and phenetic methods, species concepts, taxonomic characters, evolution, hierarchy of categories, and nomenclature. Cross-listed with BPSC 112, and ENTM 112.

BIOL 113 Advanced Cell Biology: Membranes, Organelles, and the Cytoskeleton 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; BIOL 102; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; STAT 010. An examination of the organization, function, and behavior of eukaryotic cells. Topics include membrane systems, protein targeting, the cytoskeleton, motility, and cell division. Emphasizes the experiments that form the basis of the current understanding of the cell. The discussion section focuses on reading and analyzing original journal articles.

BIOL 114 Advanced Cell Biology: Cellular Reproduction and Signaling 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; BIOL 102; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; STAT 010. Examination of the organization, function, and behavior of eukaryotic cells. Explores molecular mechanisms used by cells to control reproduction, growth, and responses to extracellular signals. Emphasizes experiments that form the basis of the current understanding of the cell. The discussion section focuses on reading and analyzing original journal articles.

BIOL 115 Human Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102; BCH 100 or BCH 110A or BCH 110HA. An introduction to human genetics. Topics include human gene organization, chromosome structure, chromosomal aberrations, patterns of single-gene inheritance, multifactorial disorders, developmental biology in medicine, cancer genetics, prenatal diagnosis, personalized health care, gene therapy, and ethical issues in medical genetics.

BIOL 116 Ecology and Conservation Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C with a grade of C- or better; CHEM 001C or CHEM 01HC; MATH 007B or MATH 09HB or MATH 009B; or consent of instructor. Introduces principles of ecology emphasizing the implications for the conservation of biodiversity. Topics include physiological ecology, organismal adaptations to the environment, life histories, the niche concept, population growth, interspecific interactions, and the structure and functioning of communities and ecosystems. Also covers topics in applied ecology and conservation biology.

BIOL 117 Evolutionary Ecology 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): BIOL 005C, STAT 010; or consent of instructor. An introduction to the interplay between ecology and evolution and an overview of modern research in the field. Topics include major evolutionary and ecological transitions, life history evolution, coevolution, and species diversification. Includes a combination of indoor laboratory activities and 5-hour field trips to local habitats.

BIOL 118 Methods in Molecular Ecology and Evolution 4 Lecture, 2 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): BIOL 005C with a grade of C- or better; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; MATH 007B or MATH 009B or MATH 9HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; STAT 010. Covers theory, techniques, and analytical methods for interpreting patterns of genetic variation based on current high-throughput DNA sequencing technology. Topics include genotype calling, analysis of population structure, genome-wide association studies, and phylogenetic inference using modern computational methods. Includes laboratory techniques for sequencing library preparation.

BIOL 119 Introduction to Genomics and Bioinformatics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C with a grade of C- or better; BIOL 102; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; MATH 007B or MATH 009B or MATH 009HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC. An introduction to the science of genomics and bioinformatics. Includes genome sequencing; database techniques; structural, comparative, and evolutionary genomics; and microarray analysis.

BIOL 120 Introduction to Plant Pathology 3 Lecture, 3 hours. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; STAT 004; or equivalent. An introduction to the study of plant diseases. Topics include diseases and disease-causing agents, host-pathogen interaction during disease development, and strategies for disease management. An optional, separate laboratory is offered. Cross-listed with MCBL 120, and PLPA 120. Credit is awarded for one of the following PLPA 120, BIOL 120, MCBL 120, or PLPA 210.

BIOL 120L Introduction to Plant Pathology Laboratory 1 Laboratory, 4 hours. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; BIOL 120, may be taken concurrently or MCBL 120, may be taken concurrently or PLPA 120, may be taken concurrently; STAT 010, may be taken concurrently; BIOL 121/MCBL 121 and BIOL 124/MCBL 124 recommended; or consent of instructor. Covers fundamentals in the use of laboratory instruments and techniques for the detection, isolation, and identification of representative infectious agents that cause disease in plants. Cross-listed with MCBL 120L, and PLPA 120L. Credit is awarded for one of the following PLPA 120L, BIOL 120L, MCBL 120L, or PLPA 210.

BIOL 121 Introductory Microbiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A; BIOL 05LA or BIOL 020; BIOL 005B; BIOL 005C; CHEM 001C or CHEM 01HC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002A, may be taken concurrently or PHYS 02HA, may be taken concurrently; PHYS 02LA, may be taken concurrently or PHYS 02HLA, may be taken concurrently; BCH 100, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; STAT 010; or consent of instructor. An intensive introduction to the fundamental physiology and molecular biology of bacteria and viruses. Covers bacterial and viral molecular genetics, an introduction to microbial pathogenesis, and applications of microbiology in modern societies. Cross-listed with MCBL 121. Credit is awarded for one of the following MCBL 121, BIOL 121, or MCBL 131.

BIOL 121L Microbiology Laboratory 3 Lecture, 1 hour; laboratory, 6 hours. Prerequisite(s): BIOL 121 with a grade of C- or better or MCBL 121 with a grade of C- or better. Laboratory exercises in diagnostic bacteriology, basic virology, and epidemiology. Includes fundamental quantitative and diagnostic microbiological procedures, basic mechanisms of microbial genetic exchange, and a project examining bacterial epidemiology. Cross-listed with MCBL 121L. Credit is awarded for one of the following MCBL 121L, BIOL 121L, or MCBL 131L.

BIOL 122 Food Microbiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 010; or consent of instructor. Covers spoilage and preservation of food; food quality and indicator organisms; the role of microorganisms in the production of dairy goods and fermented beverages; food-borne pathogens and microbiological production of toxins; and classical and modern molecular methods for detection of food microorganisms. Cross-listed with MCBL 122.

BIOL 123 Introduction to Comparative Virology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 004, or equivalent; or consent of instructor. Considers viruses as infectious agents of bacteria, plants, and animals (vertebrates and invertebrates). Compares the major groups of viruses with respect to their biological and biochemical properties, molecular and genetic characteristics, and modes of replication. Cross-listed with MCBL 123, and PLPA 123.

BIOL 124 Medical Microbiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 010; or consent of instructor. An intensive introduction to the fundamental physiology and molecular biology of bacteria and viruses. Covers research strategies for examining microbial pathogenic mechanisms. Cross-listed with MCBL 124.

BIOL 127 Insect Ecology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002B or PHYS 02HB; PHYS 02LB or PHYS 02HLB; BCH 100 or BCH 110A or BCH 110HA; STAT 010, or equivalent; or consent of instructor. Introduces principles of insect ecology with examples emphasizing the Arthropoda. Topics include factors governing population growth; ecological and evolutionary interactions with hosts, competitors, and natural enemies; structure of ecological communities; and adaptations to different environments. Cross-listed with ENTM 127.

BIOL 128 Immunology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA. A study of humoral and cellular immunology. Topics include lymphoid systems, cells, antigens, antibodies, antibody formation, cellular immunity, and tumor and transplantation immunology. Discusses in detail diseases and altered immune states associated with each topic. Cross-listed with CBNS 128.

BIOL 132 Plant Anatomy 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A and BIOL 005B; BPSC 104 or BIOL 104; or consent of instructor. Functional and developmental aspects of plant cell, tissue, and organ structure. Covers all aspects of the flowering plant life cycle from germination to pollination and fruit and seed development. Cross-listed with BPSC 132.

BIOL 134 Introduction to Mycology 3 Lecture, 3 hours. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 004, or equivalent; or consent of instructor. Introduction to the morphology, taxonomy, genetics, physiology, ecology, and economic importance of the major groups of the fungi. Cross-listed with PLPA 134.

BIOL 134L Introduction to Mycology Laboratory 1 Laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, or equivalents; concurrent enrollment in BIOL 134/PLPA 134; or consent of instructor. Introduces fundamentals in the use of laboratory instruments and techniques for the isolation, cultivation, and identification of representatives of the major taxa of fungi. Cross-listed with PLPA 134L.

BIOL 138 Plant Developmental Morphology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC; BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; or consent of instructor. Introduces the key areas of research in plant morphology and developmental biology. Emphasizes flowering plants (angiosperms). Cross-listed with BPSC 138.

BIOL 143 Plant Physiology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C, MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC; BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; BPSC 104 or BIOL 104; or consent of instructor. A survey of the fundamental principles of plant physiology including photosynthesis, respiration, water relations, mineral nutrition, growth, morphogenesis, plant hormones, dormancy, and senescence. Cross-listed with BPSC 143.

BIOL 146 Plant Ecology 4 Lecture, 3 hours; laboratory, 1.8 hours; field, 1.2 hours. Prerequisite(s): BIOL 104 or BPSC 104 or BIOL 116; STAT 010; or consent of instructor. A study of the fundamentals of plant ecology. Emphasizes community ecology, environment, life histories, population dynamics, species interactions, succession, ecosystem and landscape ecology, and plant conservation ecology. Cross-listed with BPSC 146.

BIOL 148 Quantitative Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC; STAT 011; BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; BIOL 102. Examines approaches to studying the genetic basis of polygenic metric traits. Includes types of gene action, partitioning of variance, response to selection, and inferring the number and location of quantitative trait loci. Cross-listed with BPSC 148.

BIOL 150 Mammalogy 4 Lecture, 3 hours; laboratory, 3 hours; field, 48 hours per quarter. Prerequisite(s): BIOL 005B; BIOL 005C; or equivalent. Introduction to the study of mammals. Covers mammalian evolution, ecology, reproductive biology, physiology, and conservation. Labs include identification and taxonomy with particular focus on Californian species. Includes one or more overnight field trips to live-trap and observe mammals at University of California field stations.

BIOL 151 Invertebrate Zoology 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, PHYS 002A or PHYS 02HA with grades of "C-" or better. Structure, classification, and biology of the invertebrates.

BIOL 152 Principles of Invertebrate Paleobiology and Paleoecology 4 Lecture, 2 hours; laboratory, 3 hours; three 1-day field trips. Prerequisite(s): BIOL 005C with a grade of "C-" or better or BIOL 010/GEO 003 with a grade of "C-" or better. Topics include evolution and the fossil record, paleoecology, classification theory; the nature of adaptive radiations, and extinctions. Cross-listed with GEO 152.

BIOL 154 Forensic Entomology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C with a grade of C- or better; restricted to class level standing of sophomore, or junior or senior; or consent of instructor. Introduces the application of entomological principles and collection of entomological data to be used as evidence in courts of law. Explores the basis of using insects to determine time and place of death in criminal cases including the collection, handling, and identification of insects of forensic importance. Cross-listed with ENTM 154.

BIOL 155 Chromosomes 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C, MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC; BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; or consent of instructor. An examination of the structure, function, and behavior of eukaryotic chromosomes. Cross-listed with BPSC 155.

BIOL 157 Parasitology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; MATH 007B or MATH 009B or MATH 09HB; STAT 010. Surveys the biology of protozoan and helminth interactions with their human hosts.

BIOL 158 Medical Molecular Parasitology 4 Lecture, 3 hours; seminar, 1.5 hours. Prerequisite(s): BCH 110C or BCH 100HC or BIOL 107A An overview of genome organization and gene expression, with aspects of biochemistry, evolution, natural history, and clinical manifestations of human parasites Trypanosoma, Leishmania, Plasmodium,

and others. Emphasizes the molecular and biochemical adaptations to parasitism. Prior knowledge of classical parasitology is not assumed. Students present original research papers during the seminar.

BIOL 159 Biology of Nematodes 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C, MATH 007B or MATH 009B or MATH 09HB, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC, BCH 100 or BCH 100H or BCH 110A or BCH 110HA, STAT 010. An introduction to the biology of nematodes. Topics include the morphology, physiology, development, genetics, behavior, and ecology of nematodes from parasitic and free-living habitats. Includes observing the comparative morphology and biology of nematodes and giving oral presentations on selected nematode life histories. Cross-listed with NEM 159.

BIOL 160 Animal Behavior 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C with a grade of C- or better; BIOL 102 with a grade of C- or better; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC; STAT 010. An examination of behavior from an evolutionary and ecological perspective. Topics include the inheritance of behavior, evolution of communication and displays, migration and habitat selection, foraging ecology, mating systems, and the evolution of social behavior.

BIOL 160L Laboratory in Animal Behavior 1 Laboratory, 4 hours. Prerequisite(s): BIOL 160 (may be taken concurrently). Laboratory and field exercises in animal behavior. Covers topics such as foraging behavior, aggression, and territoriality.

BIOL 161A Functional Anatomy of the Vertebrates 5 Lecture, 3 hours; laboratory, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A with a grade of C- or better; BIOL 005B with a grade of C- or better; BIOL 005C with a grade of C- or better; CHEM 001C with a grade of C- or better or CHEM 01HC with a grade of C- or better; CHEM 008A with a grade of C- or better or CHEM 08HA with a grade of C- or better, CHEM 08LA with a grade of C- or better or CHEM 08HLA with a grade of C- or better; MATH 007B with a grade of C- or better or MATH 009B with a grade of C- or better or MATH 09HB with a grade of C- or better; PHYS 002A with a grade of C- or better or PHYS 02HA with a grade of C- or better. Functional anatomy of vertebrates including humans. Examines organ systems from developmental and evolutionary perspectives. Topics include phylogeny, the skeleton, and muscles. A combination of BIOL 161A, BIOL 161B, BIOL 171A, BIOL 171B, and BIOL 171L provide a one-year sequence in anatomy and physiology.

BIOL 161B Functional Anatomy of the Vertebrates 5 Lecture, 3 hours; laboratory, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 161A with a grade of C- or better; CHEM 008B with a grade of C- or better or CHEM 08HB with a grade of C- or better, CHEM 08LB with a grade of C- or better or CHEM 08HLB with a grade of C- or better; PHYS 002B with a grade of C- or better or PHYS 02HB with a grade of C- or better. Functional anatomy of vertebrates including humans. Examines organ systems from developmental and evolutionary perspectives. Topics include nervous system, integument, and circulatory, sensory, respiratory, digestive, and urogenital systems. A combination of BIOL 161A, BIOL 161B, BIOL 171A, BIOL171B, and BIOL 171L provides a one-year sequence in anatomy and physiology.

BIOL 162 Insect Behavior 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C with a grade of C- or better or BIOL 100 with a grade of C- or better or ENTM 100 with a grade of C- or better; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An analysis of the mechanisms that cause and control behavioral reactions of insects. Emphasizes ethological and physiological knowledge concerning orientation mechanisms, communication systems, learning, and the role of the nervous system in integrating behavior in insects. Cross-listed with ENTM 162.

BIOL 163 Vertebrate Natural History 5 Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): BIOL 005B; BIOL 005C; CHEM 001C or CHEM 01HC; MATH 007B or MATH 009B or MATH 09HB. Topics include ecology, evolution, and behavior of birds, mammals, reptiles, and amphibians. Laboratory covers systematics, morphology, and identification. Includes indoor labs and field trips to local habitats.

BIOL 165 Restoration Ecology 4 Lecture, 3 hours; field, 8 hours. Prerequisite(s): BIOL 104 or BPSC 104 or BIOL 116 or ENSC 100; CHEM 008B, CHEM 08LB or CHEM 08HB, CHEM 08HLB; STAT 010, may be taken concurrently; or consent of instructor. An examination of the basic ecological principles related to land restoration. Topics include enhanced succession; plant establishment; plant adaptations; ecotype; weed colonization and competition; nutrient cycling; functions and reintroduction of soil microorganisms; restoration for wildlife; and the determination of successful restoration. Includes field trips to restored sites. Cross-listed with BPSC 165.

BIOL 166 Global Change Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 116 with a grade of C- or better; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; STAT 010; or consent of instructor. Explores how global environmental change affects the ecology, physiology, behavior, and evolution of organisms. Topics include global change and its drivers including rising CO2, nitrogen deposition, temperature, and habitat alteration. Illustrates how organismal responses scale up to influence species interactions, ecological communities, and ecosystem processes.

BIOL 167 Forest Ecology 3 Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): BIOL 116. An introduction to the ecology of forest ecosystems. Explores modern research and management in the field. Topics include major forest types within California, tree physiology, forest soils, forest population and community dynamics, wildfire, and forest management. Includes combination of indoor laboratory, field labs, and field trip to local forest. Cross-listed with BPSC 167.

BIOL 168 Developmental Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BCH 110HC or BIOL 107A; a course in cell biology is recommended. An advanced description of the embryonic development of animals. Covers the basic concepts of fertilization, gastrulation, and neurulation. Analyzes topics in current developmental research, with an emphasis on the molecular mechanisms of pattern formation and differentiation.

BIOL 169 Ornithology 4 Lecture, 2 hours; laboratory, 3 hours; field, 30 hours. Prerequisite(s): BIOL 005C; CHEM 001C or CHEM 01HC; MATH 007B or MATH 009B or MATH 09HB. Topics include diversity, evolution, physiology, ecology, behavior, field identification, and conservation of species that live in Southern California. Labs and field trips include identification, anatomy, and ornithological techniques such as mist-netting. Includes over-night field trips to University of California field stations.

BIOL 170 Herpetology 5 Lecture, 3 hours; laboratory, 3 hours; field, 30 hours per quarter. Prerequisite(s): BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, MATH 007B or MATH 009B or MATH 09HB. An introduction to the study of amphibians, snakes, lizards, and turtles with emphasis on the Southwest U.S. Topics include diversity, ecology, physiology, functional morphology, biomechanics, and conservation. Field trips will involve identification and techniques for studying behavior and ecology. Lab exercises will involve functional morphology, internal anatomy, and identification.

BIOL 171A Human Anatomy 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C; CHEM 001C or CHEM 01HC; CHEM 01LC or CHEM 1HLC; CHEM 008B or CHEM 08HB; CHEM 08LB or CHEM 08HLB; MATH 007B or MATH 009B or MATH 09HB; PHYS 002B or PHYS 02HB; PHYS 02LB or PHYS 02HLB. Introduction to the structure of the human body using the an organ-systems approach. Emphasizes an overview of the major elements of human anatomy, a brief introduction to function (i.e., physiology), and the relationships among organs and organ systems. Labs provide hands-on identification of human anatomy.

BIOL 171B Human Physiology 1 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A; BIOL 05LA or BIOL 020; BIOL 005B; BIOL 005C; CHEM 001C or CHEM 01HC; CHEM 01LC or CHEM 01HLC; CHEM 008C or CHEM 08HC; CHEM 08LC or CHEM 08HLC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002B or PHYS 02HB; PHYS 02LB or PHYS 02HLB; BCH 100 or BCH 110A or BCH 110HA. Provides first-principles analysis of cell, tissue, and organ structure and function. Emphasizes an integrative, problem-solving approach using applications such as disease and exercise. Topics include the musculoskeletal, nervous, endocrine, and reproductive systems.

BIOL 171C Human Physiology 2 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 171B. Builds on concepts introduced in Biology 171B with an analysis of cell, tissue, and organ structure and function using problem-solving approaches in humans. Emphasizes applications such as extreme environments, disease, and exercise. Topics include the cardiovascular, pulmonary, digestive, and renal systems.

BIOL 171L Human Anatomy and Physiology Laboratory 1 Laboratory, 3 hours. Prerequisite(s): BIOL 171B; BIOL 171C, may be taken concurrently. Experiments in physiology, human anatomy, and histology. Covers experimentation and data analysis incorporating hematology, blood proteins, urinalysis, neuromuscular control, cardiac excitation and pharmacology, blood pressure, electrocardiography, and electroencephalography.

BIOL 172 Biology of Fishes 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B; BIOL 005C; CHEM 001C or CHEM 01HC; MATH 007B or MATH 009B or MATH 09HB. Introduction to the study of freshwater and marine fishes. Topics include diversity, ecology, physiology, functional morphology, biomechanics, and conservation. Laboratory exercises will include species identification, functional anatomy, biomechanics, and physiology. A final paper and oral presentation are required.

BIOL 173 Insect Physiology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B, BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introduction to principles of insect physiology. Covers growth, development and hormones, cuticle, nervous system, circulation, respiration, digestion, nutrition, excretion, reproduction, water balance, and temperature relations. Prior knowledge of insects not required. Cross-listed with ENTM 173.

BIOL 174 Ecological and Evolutionary Physiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; MATH 007B or MATH 009B or MATH 09HB; STAT 010. Examines the interactions between organisms and their environments emphasizing coadaptation of physiological, morphological, and behavioral phenotypes. Includes allometry and scaling, metabolism and locomotion, heat and water exchange, evolution of endothermy, artificial selection experiments, and phylogenetically based statistical methods.

BIOL 175 Comparative Animal Physiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; BIOL 161A; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; STAT 010; recommended BIOL 151 and BIOL 161B. Topics include nutrition and energy metabolism, gas exchange, circulation, and regulation of body fluid composition.

BIOL 176 Comparative Biomechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; PHYS 002C or PHYS 02HC or PHYS 040C or PHYS 040HC; BCH 100 or BCH 110A or BCH 110HA. Applies principles from physics and engineering to the study of the relationship between organismal form and function. Covers examples from diverse plant and animal systems. Includes fundamental properties of solids and fluids, viscoelasticity, drag, biological pumps, locomotion, and muscle mechanics.

BIOL 177 Exercise Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005B; or consent of instructor. An introduction to exercise biology. Integrative topics include neuromuscular function and fatigue, bioenergetics, adaptation to training, cardiorespiratory responses to acute and long-term exercise, environmental physiology, exercise capacity among disparate vertebrate groups, aging, and the comparative biomechanics of exercise. Illustrates applications to human health and sports.

BIOL 178 Hormones and Behavior 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; STAT 010. An examination of the interactions between hormones and behavior in animals including humans. Provides an overview of endocrine physiology and examines the roles of hormones in sexual differentiation, sex differences in behavior, sexual behavior, parental behavior, affiliation, aggression, stress, and mood.

BIOL 190 Special Studies 1 to 4 Individual Study, 3 to 12 hours. Prerequisite(s): consent of instructor and departmental chairperson. To be taken as a means of meeting special curricular needs. Grading basis to be selected in consultation with the instructor and departmental chairperson. Course is repeatable.

BIOL 191 Seminar in Biology 2 to 4 Seminar, 2 to 4 hours. Prerequisite(s): upper-division standing; consent of instructor. A critical study of selected topics in biology. Course is repeatable.

BIOL 194 Independent Reading 1 to 4 Research, 3 to 12 hours. Prerequisite(s): consent of instructor. Independent study under supervision of members of the faculty. Course is repeatable to a maximum of 6 units.

BIOL 197 Introduction to Research 1 to 2 Consultation, 1 to 2 hours. Prerequisite(s): sophomore, junior or senior standing and consent of instructor and departmental chairperson. Reading, planning and preliminary laboratory work to develop a research project suitable for BIOL 199, Junior/Senior Research. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BIOL 199 Junior/Senior Research 1 to 4 Laboratory, 1 to 4 hours. Prerequisite(s): junior or senior standing, a minimum GPA of 3.0 and consent of instructor and departmental chairperson. Special problems and research in biology performed under the supervision of members of the faculty of the Department of Biology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Graduate Courses

BIOL 200 Cell Biology 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently); BIOL 102 or equivalent; BIOL 113 or BIOL 114 or CBNS 101 or equivalent; graduate standing. An examination of the structure and function of eukaryotic cells and their components with emphasis on the key experiments that provide the foundation for our current knowledge. Covers topics such as cell membranes, intracellular trafficking, cell-to-cell interactions, motility, and the cytoskeleton. Cross-listed with CMDB 200.

BIOL 201 Molecular Biology 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently); BIOL 102 or equivalent; BIOL 107A or equivalent; graduate standing. Covers the structure and inheritance of genetic material, the regulation of gene expression at the cellular and molecular level including molecular mechanisms for regulation of gene transcription, posttranscriptional regulation at the level of messenger RNA stability, processing, editing and translation, methods for gene mapping, and positional cloning. Cross-listed with CMDB 201.

BIOL 203 Cellular Biophysics 3 Lecture, 3 hours. Prerequisite(s): BIOL 200/CMDB 200; BIOL 201/CMDB 201; CHEM 109 or equivalent; graduate standing; or consent of instructor. Biophysical principles that determine cellular structure and function including diffusion, electrochemical gradients, transport, macromolecular interactions, and genetic recombination. Illustrative examples are used to highlight the importance of these principles in modern cell biology and physiology.

BIOL 221 Microbial Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102; graduate standing. In-depth coverage of the genetics of microbes. Emphasizes the primary data and the foundation of modern techniques using viruses, archaea, prokaryotes, and eukaryotes. Includes genome sequences and organization, plasmids and other vectors, and mutation and genetic screens. Also covers transposable elements, recombination, and regulation of gene expression, development, and pathogenesis. Cross-listed with MCBL 221, and PLPA 226.

BIOL 250 Special Topics in Biology 1 to 2 Seminar, 1 to 2 hours. Prerequisite(s): graduate standing and consent of instructor. Oral presentations and intensive small-group discussion of selected topics in the area of special competence of each staff member. Course content will emphasize recent advances in the special topic area and will vary accordingly. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

BIOL 252 General Colloquium in Biology 1 Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing Oral reports by visiting scholars on current biological research. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

BIOL 261 Seminar in Genetics, Genomics, and Bioinformatics 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BPSC 261, ENTM 261, PLPA 261, and GEN 261.

BIOL 281 (E-Z) Seminar in Cell Development, Structure, and Function 2 Seminar, 2 hours. Prerequisite(s): graduate standing. Lectures, discussions, and demonstrations by students, faculty, and invited scholars on selected subjects concerned with the principles of cell development, structure, and function. E. Cell Biology; F. Molecular Biology; G. Developmental Biology. Course is repeatable to a maximum of units. Cross-listed with CMDB 281 (E-Z).

BIOL 284 Seminar in Biology 2 to 4 Seminar, 2 to 4 hours. Prerequisite(s): graduate standing; consent of instructor. Consists of lectures, discussions, and demonstrations by students, faculty, and invited scholars on selected topics concerned with the principles of biology. Course is repeatable.

BIOL 289 Special Topics in Neuroscience 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussion of selected topics in neuroscience. Content and instructor(s) vary each time course is offered. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with BCH 289, CHEM 289, ENTM 289, NRSC 289, and PSYC 289.

EEOB 210 Organismal Biology 4 Lecture, 4 hours. Prerequisite(s): at least one upper division undergraduate course that covers the principles of physiology (such as animal physiology, plant physiology, human physiology, or comparative anatomy and physiology), or a similar course, AND an upper division undergraduate course that covers the principles of evolution, or a similar course; graduate standing; or consent of instructor. Explores the historical development of modern ideas in organismal biology. Topics include homeostasis, scaling, energetics, structure-function relationships, control systems, and response systems. Examines recent research in the context of the classic studies.

EEOB 211 Foundations of Ecology 4 Lecture, 4 hours. Prerequisite(s): BIOL 116; graduate standing; or consent of instructor. Examination of the history, theory, and interrelationships of fundamental ecological principles through readings and discussions of classic and recent literature. Topics include quantitative, population, community, ecosystem, evolutionary, and conservation ecology.

EEOB 212 Ecological Systems in Space and Time 4 Lecture, 3 hours; field, 30 hours per quarter. Prerequisite(s): one upper-division undergraduate course in population or community ecology or paleoecology; graduate standing; or consent of instructor. Focuses on how ecological systems are interpreted and reconciled at the community, landscape, and paleontological scales. Addresses the role of extrinsic factors operating at each of these scales. Also examines the historical development of our understanding of ecological systems at various scales. Cross-listed with ENTM 212, and GEO 212.

EEOB 213 Behavioral Ecology 4 Lecture, 4 hours. Prerequisite(s): BIOL 160; graduate standing; or consent of instructor. Examines animal behavior in an evolutionary context. Traces the historical development of the study of behavior, drawing from ethology, comparative psychology, and sociobiology. Topics include evolution of sociality, sexual selection, predator-prey behavior, and parental care.

EEOB 214 Evolutionary Genetics 4 Lecture, 4 hours. Prerequisite(s): BIOL 108; graduate standing; or consent of instructor. Traces the historical development of modern ideas in evolutionary genetics. Focuses on the influence of Fisher, Haldane, and Wright on current views of genetic variation in natural populations, by examining recent research in the context of their classic works.

EEOB 215 Advanced Methods of Data Analysis in Evolution, Ecology, and Behavior 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): PSYC 212 or STAT 011; or equivalent; graduate standing. Introduces new methods of data analysis in the fields of evolution, ecology, and behavior. Covers theory and practical application using relevant examples. Topics include maximum likelihood, randomization, the jackknife, bootstrapping, Monte Carlo approaches, and meta-analysis.

EEOB 216 The Theory of Evolution 4 Lecture, 4 hours. Prerequisite(s): BIOL 105; graduate standing; or consent of instructor. Traces the historical development of modern ideas in evolutionary theory. Focuses on the influence of Darwin and of the various authors of the modern synthesis on current views of macroevolution by examining recent research in the context of their classic works.

EEOB 217 Advanced Population and Community Ecology 4 Lecture, 4 hours. Prerequisite(s): one upper-division undergraduate class in population or community ecology; graduate standing; or consent of instructor. Traces the development of the major concepts in ecology. Focuses on the influence of pioneers in the field, historical roots of key concepts, and key controversies. Evaluates current research with reference to these historical origins.

EEOB 219 Theory of Systematics 4 Lecture, 4 hours. Prerequisite(s): BIOL 112/BPSC 112/ENTM 112 or equivalent; graduate standing; or consent of instructor. Examines topics developed around a series of classical and recent papers on the principles, philosophy, and methodology of modern systematics and phylogenetic methods. Cross-listed with ENTM 219, and GEO 219.

EEOB 220 Evolutionary Physiology 4 Lecture, 4 hours. Prerequisite(s): an upper-division course in evolution and animal physiology or behavior; an upper-division course in statistics that covers analysis of covariance; graduate standing; or consent of instructor. Covers evolutionary approaches to the study of animal physiology. Includes organismal and organ-system physiology; biomechanics and locomotor mechanisms; cell physiology; the development of physiological systems; and behavioral neuroscience.

EEOB 230 Analysis of Ecological Communities 5 Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): PSYC 212 or STAT 231B or equivalent; graduate standing; consent of instructor. Covers principles of multivariate analysis and its application to the interpretation of ecological community data. Topics include multiple and partial correlation and regression, canonical correlation, detrended and canonical correspondence analysis, multidimensional scaling, similarity indices and cluster analysis, and discriminant analysis.

EEOB 265 Advances in Population and Evolutionary Biology 1 or 2 Seminar, 1 hour; research, 0 or 3 hours. Prerequisite(s): graduate standing or consent of instructor. Presentations by visiting scholars, faculty, and students on current research topics in population and evolutionary biology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

EEOB 282 Seminar in Genetics and Evolution 2 to 4 Seminar, 2 to 4 hours. Prerequisite(s): graduate standing; consent of instructor. Presentations by students, faculty, and invited scholars on selected topics concerned with the principles of genetics and evolution. Course is repeatable.

EEOB 283 Seminar in Organismal Biology 1 to 4 Seminar, 1 to 4 hours. Prerequisite(s): graduate standing; consent of instructor. Presentations by students, faculty, and invited scholars on selected topics concerned with the principles of organismal biology, including physiology, behavior, morphology, biomechanics, and related topics. Course is repeatable to a maximum of 18 units.

EEOB 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual studies on specially selected topics in evolution, ecology, and organismal biology under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

EEOB 291 Individual Study in Coordinated Areas 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing Provides a program of study designed to advise and assist candidates who are preparing for examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

EEOB 292 Concurrent Analytical Studies in Evolution, Ecology, and Organismal Biology 2 to 4 Research, 6 to 12 hours. Prerequisite(s): consent of instructor. Elected concurrently with an appropriate undergraduate course but on an individual basis. Devoted to one or more graduate papers based on research or criticism related to the course. Faculty guidance and evaluation provided throughout the quarter. Course is repeatable.

EEOB 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing. Directed research in evolution, ecology, and organismal biology. Experimental studies on specially selected topics under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

EEOB 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

BIOL 301 Teaching of Biology at the College Level 1 Seminar, 1 hour. Prerequisite(s): graduate standing. A program of weekly meetings and individual formative evaluations required of new Biology Teaching Assistants. Covers instructional methods and classroom/section activities most suitable for teaching Biology. Conducted by the TA Development Program. Graded Satisfactory (S) or No Credit (NC).

BIOL 303 Philosophy and Pedagogy of Teaching Undergraduate Life Sciences 3 Lecture, 1 hour; laboratory, 3 hours; workshop, 1 hours. Prerequisite(s): graduate standing in life sciences. Explores the opportunities and challenges associated with developing an undergraduate course in the life sciences. Emphasizes determining how students learn, as well as exploring contemporary instruction methods that foster student engagement in the classroom. Graded Satisfactory (S) or No Credit (NC). Cross-listed with ENTM 303.

EEOB 400 Introduction to Graduate Study in Biology 2 Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Introduces opportunities and requirements for successful graduate study. Emphasis is placed on effective strategies for developing and implementing a program of professional development and graduate research. Graded Satisfactory (S) or No Credit (NC).

Biomedical Sciences

Subject abbreviation: BMSC
Division of Biomedical Sciences

Deborah Deas, M.D., M.P.H., Vice Chancellor, Health Sciences; the Mark and Pam Rubin Dean, UCR School of Medicine

Monica J. Carson, Ph.D., Chair, *S. Sue Johnson Presidential Endowed Chair in Glial-Neuronal Interactions*

Division of Biomedical Sciences
School of Medicine Education Building 1
(951) 827-0936;
biomed.ucr.edu

Professors

Monica J. Carson, Ph.D. *Neuroimmunology*
Djurdjica Coss, Ph.D. *Endocrinology, Neuroscience*
Nicholas V. DiPatrizio, Ph.D. *Biomedical Sciences*
Iryna M. Ethell, Ph.D. *Neuroscience*
Martin I. Garcia-Castro, Ph.D. *Biomedical Sciences*
Adam Godzik, Ph.D. *Bruce D. and Nancy B. Varner Presidential Endowed Chair in Cancer Research*
Marcus Kaul, Ph.D. *Neuroscience*
David Lo, M.D., Ph.D. *Distinguished Professor, Genetics and Mucosal Immunity*
Declan McCole, Ph.D. *Physiology, Pharmacology*
Lidia Kos, Ph.D. *Vice President & Dean of Graduate Studies*
Meera G. Nair, Ph.D. *Infectious Diseases, Mucosa/Immunology*
Andre Obenaus, Ph.D., *Neuroimaging, Neurotrauma and Neurodegeneration*
Scott Pegan, Ph.D. *Innate Immunity*
Maurizio Pellecchia, Ph.D., Distinguished Professor, *Daniel Hays Endowed Chair in Cancer Research, Drug Discovery*
Seema K. Tiwari-Woodruff, Ph.D. *Neurodegenerative Diseases/Glia Biology*
Emma Wilson, Ph.D. *Parasite Immunologist*
Sika Zheng, Ph.D. *Neurobiology/Molecular Genetics*
Changcheng Zhou, Ph.D. *Xenobiotics, Cardiovascular and Metabolic Disease*

Professors Emeriti

Mary Ann Baker, Ph.D. *Neurosciences*
Craig V. Byus, Ph.D. *Pharmacology* (Biomedical Sciences/Biochemistry)
Kathryn DeFea, Ph.D. *Cell Biology/Biochemistry*
David A. Johnson, Ph.D. *Pharmacology*
Richard A. Luben, Ph.D. *Endocrinology* (Biomedical Sciences/Biochemistry)
Christian Y. Lytle, Ph.D. *Physiology*
Neal L. Schiller, Ph.D. *Distinguished Teaching Professor, Microbiology/Immunology*
Michael B. Stemerman, M.D. *Biomedical Sciences*
Daniel S. Straus, Ph.D. *Human Genetics* (Biomedical Sciences)
Ameae M. Walker, Ph.D. *Distinguished Teaching Professor, Microanatomy*

Adjunct Professor

Byron Ford, Ph.D., *Biomedical Sciences*

Adjunct Associate Professor

Qi Chen, Ph.D., *Biomedical Sciences*

Associate Professor

Milton Hamblin, Ph.D., *Vascular Biology*
Xuecai Ge, Ph.D., *Biomedical Sciences*

Assistant Professors

Erica Heinrich, Ph.D. *Integrative Physiology, Hypoxia and High Altitude Medicine*
Jean-Pyo Lee, PhD. *Stroke, Cardiovascular Disease, and Stem Cells*
Joy S. Xiang, Ph.D., *RNA Biology & Therapeutics*
Natalie Zlebnik, Ph.D. *Addiction*

**

Professor in Residence

Devin Binder, M.D., Ph.D. *Clinical Neuroscience*

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

B.S. Degree Requirements

The following major requirements apply only to students who, in truly exceptional cases, matriculate into the Thomas Haider Program at the UCR School of Medicine without a UCR baccalaureate degree. These students are eligible to receive a B.S. degree in Biomedical Sciences upon satisfactory completion of the first year of the curriculum leading to the M.D. degree.

Major Requirements

1. **Biological Sciences Core Curriculum (65-68 units)**
   a) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C or equivalent
   b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC, CHEM 112A, CHEM 112B, CHEM 112C or equivalent
   c) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC or equivalent
   d) MATH 008B or MATH 009A, MATH 009B or equivalent
   e) STAT 100A or equivalent
   f) BCH 100 or BCH 110A or equivalent
2. **Courses taken during the first year of medical school (59 units)**
   BMSC 231, BMSC 231M, BMSC 232, BMSC 232M, BMSC 233, BMSC 233M, BMSC 234, BMSC 234M, BMSC 235, BMSC 235M

Lower-Division Courses

BMSC 091 Freshman Advising Seminar For Medical Scholars Program Students 1 Seminar, 1 hour. Prerequisite(s): freshman standing in the Medical Scholars Program. Introduction to UCR for students in the Medical Scholars Program. Focuses on learning the necessary survival skills to succeed in college and prepare for a career in the allied health sciences. Graded Satisfactory (S) or No Credit (NC).

BMSC 092 First-Year Seminar For Medical Scholars Program Students: Topics in Health Careers 1 Seminar, 1 hour. Prerequisite(s): freshman standing in the Medical Scholars Program or consent of instructor. A discussion of health careers in biomedical sciences and allied health sciences for students in the Medical Scholars Program. Graded Satisfactory (S) or No Credit (NC).

BMSC 093 Seminar For Medical Scholars Program Students 1 Seminar, 1 hour. Prerequisite(s): lower-division standing in the Medical Scholars Program or consent of instructor. A discussion of special topics in biomedical sciences and allied health sciences as they pertain to students in the Medical Scholars Program. Graded Satisfactory (S) or No Credit (NC).

BMSC 094 Independent Reading 1 to 2 Consultation, 1 to 2 hours. Prerequisite(s): consent of instructor. Independent study under faculty supervision. Possible topics include modern approaches to the pathophysiology of disease, delivery of medical care to the community, or current medical education. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.

BMSC 097 Research Tutorial in Biomedical Sciences 1 to 2 Laboratory, 3 to 6 hours. Prerequisite(s): grade point of 3.0 and consent of instructor. Laboratory tutorial in research related to biomedical sciences. To provide laboratory experience in the areas of physiology, microbiology, molecular biology, pharmacology, cell biology, immunology, biochemistry for exceptional lower-division students. A written report is required at the end of each quarter. Graded Satisfactory (S) or No Credit (NC). May be repeated for up to 6 units.

Upper-Division Courses

BMSC 191 Seminar in Biomedical Sciences 2 Seminar, 20 hours per quarter. Prerequisite(s): upper-division standing in the Medical Scholars Program or consent of instructor. Special topics in biomedical sciences, healthcare delivery, cultural competency, biomedical research, and related areas. Course is repeatable to a maximum of 6 units.

BMSC 194 Independent Reading 1 to 2 Discussion, 1 hour; research, 2 to 3 hours. Prerequisite(s): upper-division standing and consent of instructor and Divisional Dean Independent study involving library projects on topics related to Biomedical Sciences. Independent study will be conducted under faculty supervision. A written report to be graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.

BMSC 197L Research For Undergraduates 1 to 3 Laboratory, 3 to 9, hours. Prerequisite(s): upper-division standing (completion of 90 quarter units) and consent of instructor. An introduction to the methods of research in biomedical sciences. The student will conduct investigation in an area of biomedical sciences under the supervision of a Division of Biomedical Sciences faculty member and submit a written report on his/her work. Course is repeatable.

Graduate Courses

BMSC 202 Molecular Basis of Disease 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Discusses the molecular basis of disease emphasizing new developments and the broad application of approaches and techniques. Course is repeatable.

BMSC 222 (E-Z) Special Topics in Biomedical Sciences 2 Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing. Oral presentations and intensive small-group discussion of selected topics in the area of special competence of each faculty member. Course emphasizes recent advances in the special topic area and varies accordingly. E. Membranes & Ion Trans Pheno; G. Mechanisms For Cntrl Cell P; J. Host Defense Mechanisms; L. Hormone Secretion; M. Hormone Action; N. Mechanisms Of Steroid Hormones; O. Steroid Metabolism; P. Drug & Hormone-receptor Int; Q. Mechanisms Of Carcinogenesis; U. The Mechanisms Of Locomotio; W. Advanced Immunology; X. Mutagenesis&genetic Instabilty; Y. Cancer Genetics. Course is repeatable to a maximum of units.

BMSC 223 (E-Z) Themes in Human Biology and Disease 2 to 4 Activity, 6 to 12 hours. Prerequisite(s): see individual segment descriptions for hours and prerequisites; restricted to major(s) Biomedical Sciences; graduate standing; or consent of instructor. Involves writing a paper on current basic research relevant to the course theme.

BMSC 223E Inflammation, Autoimmunity, and Pathogen Defense 3 Lecture, 23 hours per quarter; discussion, 8 hours per quarter; laboratory, 8 hours per quarter. Prerequisite(s): graduate standing; and consent of instructor. Integrative view of the human immune system and inflammation in health and disease.

BMSC 223F Cardiovascular Physiology 4 Lecture, 30.5 hours per quarter; discussion, 11.5 hours per quarter; laboratory, 5 hours per quarter. Prerequisite(s): graduate standing; and consent of instructor. Integrative view of the human cardiovascular system in health and disease.

BMSC 223G Renal Physiology 3 Lecture, 22 hours per quarter; discussion, 8 hours per quarter; laboratory, 2 hours per quarter. Prerequisite(s): graduate standing; and consent of instructor. Provides an integrative view of human kidney function and dysfunction.

BMSC 223I Themes in Human Biology and Disease 3 Lecture, 25 hours per quarter; discussion, 8 hours per quarter; laboratory, 6.5 hours per quarter. Prerequisite(s): graduate standing; and consent of instructor. Integrative view of the human respiratory system in health and disease.

BMSC 223J Themes in Human Biology and Disease 3 Lecture, 33 hours per quarter; laboratory, 6 hours per quarter. Prerequisite(s): graduate standing; and consent of instructor. Provides and integrative view of the human gastrointestinal system in health and disease.

BMSC 229 Foundations in Translational Research 8 Lecture, 67 hours per quarter; discussion, 7 hours per quarter; laboratory, 18 hours per quarter. Prerequisite(s): restricted to major(s) Biomedical Sciences; graduate standing; or consent of instructor. Covers basic principles of disease processes, genetics, and molecular, cellular, and developmental biology. Provides case-driven instruction through lectures and discovery in small group discussions and laboratories. Offered in Summer only.

BMSC 231 Foundations of Medicine I 7.5 Lecture, 65.5 hours per quarter; discussion, 6 hours per quarter; laboratory, 20.5 hours per quarter. Prerequisite(s): restricted to major(s) Biomedical Sciences; graduate standing; or consent of instructor. Covers basic principles of disease processes, genetics, and molecular, cellular, and developmental biology. Explores cases in lectures and promotes discovery in small group discussions, laboratories, and conferences. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BMSC 232 Cardiovascular, Renal, and Respiratory Sciences I 12 Lecture, 107 hours per quarter; discussion, 9 hours per quarter; laboratory, 19 hours per quarter. Prerequisite(s): BMSC 229 or BMSC 231; restricted to major(s) Biomedical Sciences, Medicine; graduate standing; or consent of instructor. Covers physiology, pathophysiology, physical diagnosis, and imaging in the cardiovascular, renal, and respiratory sciences. Instruction is driven by cases and accomplished through lectures and discovery in small group discussions, laboratories, and conferences. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BMSC 233 Gastrointestinal, Endocrine, and Reproductive Health I 10 Lecture, 85 hours per quarter; discussion, 8 hours per quarter; laboratory, 21 hours per quarter. Prerequisite(s): restricted to major(s) Biomedical Sciences, Medicine; graduate standing; or consent of instructor. Covers biochemistry, pathophysiology, physical diagnosis, and imaging associated with gastrointestinal, endocrine, and reproductive health. Instruction is driven by cases and accomplished through lectures and discovery in small group discussions, laboratories, and conferences. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BMSC 234 Musculoskeletal Medicine 4 Lecture, 36 hours per quarter; discussion, 2 hours per quarter; Laboratory, 7 hours per quarter. Prerequisite(s): first-year standing in medical school or the graduate program in Biomedical Sciences or consent of instructor; BMSC 233. Covers the musculoskeletal system, biology and pathology of the peripheral nervous system, and physical diagnosis. Utilizes lectures and case studies to accomplish course objectives.

Promotes discovery of learning by small group discussions, laboratories, and conferences. Credit is awarded for only one of BMSC 234 or MDCL 234.

BMSC 235 Clinical Neurosciences I 5 Lecture, 42 hours per quarter; discussion, 8 hours per quarter; laboratory, 6 hours per quarter Prerequisite(s): BMSC 234. Covers neurobiology and provides an introduction to neurology and psychiatry, as well as physical diagnosis and imaging of the nervous system. Utilizes lectures and case studies to accomplish course objectives. Promotes discovery of learning by small group discussions, laboratories, and conferences. Credit is awarded for only one of BMSC 235 or MDCL 235.

BMSC 236 Foundations of Medicine 2 10 Lecture, 93 hours per quarter; discussion, 8 hours per quarter; laboratory, 10 hours per quarter. Prerequisite(s): second-year standing in medical school or the graduate program in Biomedical Sciences or consent of instructor; BMSC 235. Covers the pathophysiology, pharmacology, physical diagnosis and treatment of infectious diseases, clinical hematology and oncology, and epidemiology and clinical reasoning skills. Instruction involves weekly cases and is presented through lectures and discovery in small group discussions, laboratories, and conferences. Students using this course to fulfill requirements for the Ph.D. degree in Biomedical Sciences receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade.

BMSC 240 Biostatistics Concepts and Tools of Statistics in Biomedical Sciences 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to major(s) Biomedical Sciences; graduate standing; or consent of instructor. Provide comprehensive understanding of the fundamental concepts and essential tools of (bio)statistics as applied to clinical and biomedical research. Emphasizes the practical application of statistical methods in real-world biomedical scenarios. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BMSC 241 Databases in Biomedical Sciences For Research and Clinical Support 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to major(s) Biomedical Sciences; graduate standing; or consent of instructor. Introduces the landscape of biomedical databases and their use in both research and clinical support. Provides knowledge and practical skills to navigate, retrieve, and critically evaluate data from databases to answer research questions, collaborate on projects, and support clinical decision-making. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BMSC 242 Data Analysis and Scientific Writing Using Biostatistics and Public Databases 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BMSC 240 with a grade of C- or better, BMSC 241 with a grade of C- or better; Bioinformatics concepts and molecular biology are recommended; restricted to major(s) Biomedical Sciences; graduate standing; or consent of instructor. Focuses on the practical application of biostatistical methods to real-world biomedical data using tools like R or Python. Provides hands-on coding experience, data analysis, results interpretation, and communication of findings through scientific writing. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BMSC 251 Colloquium in Biomedical Sciences 1 Colloquium, 1 hour. Prerequisite(s): graduate standing in Biomedical Sciences or consent of instructor. Specialized discussions by staff and students of current research topics in biomedical sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BMSC 252 General Seminar in Biomedical Sciences 1 Seminar, 1 hours. Prerequisite(s): graduate standing. Oral presentations by staff and visiting scholars on current research topics in the field of biomedical sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BMSC 254 Graduate Seminar in Biomedical Sciences 1 Seminar, 1 hour. Prerequisite(s): graduate standing. Oral reports by graduate students on current research topics in biomedical sciences. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

BMSC 260A Topics in Translational Biomedical Research 2 Lecture, 2 hours per quarter; discussion, 18 hours, per quarter. Prerequisite(s): consent of instructor or graduate advisor; concurrent enrollment in BMSC 232. A survey of the mechanisms of common human diseases at the molecular, cellular and organ system levels and the multidisciplinary approaches used for their investigation. Instructional components include lectures, discovery in problem-based learning sessions, and independent study. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BMSC 260B Topics in Translational Biomedical Research 2 Lecture, 2 hours; discussion, 18 hours per quarter. Prerequisite(s): consent of instructor or graduate advisor; concurrent enrollment in BMSC 233. A survey of the mechanisms of common human diseases at the molecular, cellular and organ system levels and the multidisciplinary approaches used for their investigation. Instructional components include lectures, discovery in problem-based learning sessions, and independent study. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BMSC 260C Topics in Translational Biomedical Research 2 Lecture, 2 hours; discussion, 18 hours per quarter. Prerequisite(s): consent of instructor or graduate advisor; concurrent enrollment in BMSC 234 and BMSC 235. A survey of the mechanisms of common human diseases at the molecular, cellular and organ system levels and the multidisciplinary approaches used for their investigation. Instructional components include lectures, discovery in problem-based learning sessions, and independent study. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BMSC 261 Methods in Biomedical Research 1 Tutorial, 3 hours. Prerequisite(s): graduate standing in Biomedical Sciences or consent of instructor. Experimental studies on a specific laboratory technique involved in the study of human disease. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units.

BMSC 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing in Biomedical Sciences or consent of instructor. Experimental or literature studies on specifically selected topics under direction of a staff member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BMSC 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing in Biomedical Sciences or consent of instructor. Directed research in biomedical sciences performed prior to advancement to candidacy in preparation for dissertation projects. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BMSC 299 Research For Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing in Biomedical Sciences or consent of instructor. Original research in the area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Course

BMSC 302 Directed Teaching 2 Practicum, 6 hours. Prerequisite(s): graduate standing in Biomedical Sciences. Supervised teaching in medical school courses. Required for all Biomedical Sciences graduate students. Fulfills the teaching portion of the teaching requirement for the Ph.D.; four units are required for the Ph.D. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

Biomedical Sciences Graduate Program

Subject abbreviation: BMSC
Division of Biomedical Sciences

Seema Tiwari-Woodruff, Ph.D.,
Program Director
Milton Hamblin, Ph.D
Masters Degree and Post-Bac Program Director
BMSC Graduate Student Affairs Office
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Professors

Michael E. Adams, Ph.D. (Entomology)
Bahman Anvari, Ph.D. (Bioengineering)
Peter Atkinson, Ph.D. (Entomology)
Monica J. Carson, Ph.D. (Biomedical Sciences)
Djurdjica Coss, Ph.D. (Biomedical Sciences)
Margarita C. Curras-Collazo, Ph.D. (Cell Biology and Neuroscience)
Anupama Dahanukar Ph.D. (Entomology)
Adler Dillman, Ph.D. (Nematology)
Nicholas DiPatrizio, Ph.D. (Biomedical Sciences)
David A. Eastmond, Ph.D. (Cell Biology and Neuroscience)
lryna Ethell, Ph.D. (Biomedical Sciences)
Martin I. Garcia-Castro, Ph.D. (Biomedical Sciences
Ted Garland, Ph.D. (Biology)
Adam Godzik, Ph.D. (Biomedical Sciences)
Richard Hooley, Ph.D. (Chemistry)
Kelly Huffman, Ph.D. (Psychology)
Marcus Kaul, Ph.D. (Neuroscience)
Karine Le Roch, Ph.D. (Cell Biology and Neuroscience)
Jiayu Liao, Ph.D. (Bioengineering)
Huinan Liu, Ph.D. (Bioengineering)
Xuan Liu, M.D., Ph.D. (Biochemistry)
David Lo, M.D., Ph.D. (Biomedical Sciences)
Morris Maduro, Ph.D. (Biology)
Ernest Martinez, Ph.D. (Biochemistry)
Manuela M. Martins-Green, Ph.D. (Cell Biology and Neuroscience)
Declan McCole, Ph.D. (Biomedical Sciences)
Meera G. Nair, Ph.D. (Biomedical Sciences)
Scott Pegan, Ph.D. (Biomedical Sciences)
Morris Maduro, Ph.D. (Molecular Cell & Systems Bio)
Andre Obenaus, Ph.D. (Biomedical Sciences)
Anandasankar Ray, Ph.D. (Molecular Cell & Systems Bio)
Maurizio Pellecchia, Ph.D. (Biomedical Sciences)
Michael C. Pirrung, Ph.D. (Chemistry)
Khaleel Razak, Ph.D. (Psychology)
Victor Rodgers, Ph.D. (Bioengineering)
Wendy Saltzman, Ph.D. (Biology)
B. Glenn Stanley, PhD (Psychology)
Frances M. Sladek, Ph.D. (Cell Biology and Neuroscience)
Viji Santhakumar, Ph.D. (Neuroscience)
Seema K. Tiwari-Woodruff, Ph.D. (Biomedical Sciences)
Yinsheng Wang, Ph.D. (Chemistry)
Emma Wilson, Ph.D. (Biomedical Sciences)
Sika Zheng, Ph.D. (Biomedical Sciences)
Changcheng Zhou, Ph.D. (Biomedical Sciences)

Associate Professors

Qi Chen, M.D. Ph.D. (Biomedical Sciences)
Jun-Hyeong Cho, Ph.D. (Molecular, Cell and Systems Biology)
Scott N. Currie, Ph.D. (Cell Biology and Neuroscience)
Todd A. Fiacco, Ph.D. (Cell Biology and Neuroscience)
Xuecai Ge, Ph.D. (Biomedical Sciences)
Weifeng Gu, Ph.D. (Molecular Cell & Systems Bio)
Rong Hai, Ph.D. (Microbiology & Plant Path)
Milton Hamblin, Ph.D. (Biomedical Sciences)
Peter W. Hickmott, Ph.D. (Psychology)
Ansel Hsiao, Ph.D. (Microbiology)
Ted Karginov, Ph.D. (Cell Biology and Neuroscience)
Edward Korzus, Ph.D. (Psychology)
Sean O'Leary, Ph.D. (Biochemistry)
Hyle Park, Ph.D. (Bioengineering)
Martin Riccomagno, Ph.D. (Molecular Cell & Systems Bio)
Rachel Wu, Ph.D. (Psychology)
Samantha Ying, Ph.D. (Environmental Sciences)
Edward Zagha, M.D., Ph.D. (Psychology)

Assistant Professors

Kandis Leslie Abdul-Asiz, Ph.D. (Chemical and Environmental Engineering)
Sihem Cheloufi, Ph.D. (Biochemistry)
Rong Hai, Ph.D. (Plant Pathology & Microbiology)
Erica Heinrich, Ph.D. (Biomedical Sciences)
Jean-Pyo Lee (Stroke/Stem Cells)
Jernej Murn, Ph.D. (Biochemistry)
Juliet Morrison, Ph.D. (Microbiology & Plan Path)
Joy Xiang (RNA Biology)
Hongdian Yang, Ph.D. (Molecular, Cell and Systems Biology)
Natalie Zlebnik, Ph.D. (Biomedical Sciences)

Professor in Residence

Devin Binder, M.D., Ph.D. (Biomedical Sciences)

Graduate Program

The multidisciplinary interdepartmental graduate program in Biomedical Sciences offers graduate instruction leading to a M.S degree, a Ph.D. degree or a combined M.D.-Ph.D. degree.

The aim of the graduate program is to provide students with training that crosses traditional boundaries between scientific disciplines and allows them to address modern biomedical research questions. The objective is to train scientists who have a broad knowledge of basic medical sciences, a high degree of expertise in an area of specialization, and effective teaching skills for a medical school or university environment.

The need for scientists who understand the interrelationships of various areas of medical science is readily apparent. For example, it is clearly advantageous for a scientist studying diabetes to understand the disease in depth. This requires a fundamental understanding of endocrinology (hormone secretion and action), cell biology (cell types that produce insulin and upon which insulin acts), biochemistry (insulin-receptor interactions, biochemical pathways regulated by insulin), genetics (hereditary factors in the development of diabetes), immunology (autoimmune mechanisms in diabetes), anatomy (microvascular pathology) and environmental exposures. There is a growing need for scientists who can communicate among disciplines so that very effective research collaborations can be developed.

Cell Biology/Physiology research areas include function of Epigenetics, RNA splicing, and transcription factors in development, disease, and in the promotion of regeneration; fluid and electrolyte pathophysiology; molecular genetics of human cell response to environmental carcinogens; factors controlling lymphocyte differentiation; mechanisms of action of cytotoxic lymphokines; physiological aspects of host-parasite interaction; host defense mechanisms in infectious disease; mucosal immunity and molecular approaches to vaccine development; hypoxia, cardiovascular and metabolic disease.

Endocrinology/Pharmacology research areas include molecular mechanisms of obesity; fertility and reproductive biology; endocannabinoids; regulation of eating behavior; molecular mechanisms for carcinogenesis (glioblastoma, breast and prostate cancer); drug development.

Neurosciences research areas includes studies of the hypothalamic control of homeostatic and sexual function; molecular mechanisms of neurodevelopment, neuroinflammation, neuronal death and neuro degeneration, and gut-brain interactions with emphasis on the following diseases: Alzheimer's disease, Parkinson's disease, Autism, Fragile X/intellectual disability, multiple sclerosis, epilepsy, traumatic brain injury, stroke and pathogen-induced encephalitis.

Admission

Applicants should have completed an undergraduate degree in one of the physical or biological sciences and must submit scores from the GRE General Test (verbal and quantitative). (GRE requirement not applicable to UCR Biomedical Sciences students applying for the M.D.–Ph.D.) Courses required for admission include one year each of general chemistry, organic chemistry, physics, and calculus and at least two years of biological sciences. Preferred upper-division courses in biology include vertebrate or human anatomy and physiology, embryology, genetics, cell biology, microbiology, immunology, and neurosciences.

Doctoral Degree

The aim of the graduate program in Biomedical Sciences is to train Ph.D. scientists in a specific area of research specialization who also have enough general knowledge in the basic medical sciences to apply their research expertise to unraveling the basis of disease. This approach includes understanding not only pathogenic manifestations of disease but also the normal physiologic state. To accomplish this, the student completes a core and elective curriculum, the latter tailored to the student's research interests.

Core requirements include:

1. BMSC 229: Foundations of Translational Research
2. BMSC 232, 233, 234 and 235: Foundations of Medicine Series
3. BMSC 260A, BMSC 260B, BMSC 260C: Topics in Biomedical Research. The entire 3 quarter series is required in the second year of graduate education.
4. BMSC 261: Methods in Biomedical Research. Enrollment required all 3 quarters of the first year of graduate education.
5. BMSC 252: General seminar in Biomedical Sciences (enrollment required each quarter)
6. BMSC 254: Graduate seminar in Biomedical Sciences (enrollment required each quarter)
7. BMSC 302: (one-quarter requirement, not required of M.D.–Ph.D. students)

Under normal circumstances, each student should complete core course work requirements 1-4 during the first year of studies.

At the end of the student's first full year of residence, the advisory committee for each student evaluates the progress of the student and recommends to the faculty whether the student should continue in the program.

In addition, prior to advancement to candidacy and at the beginning of each academic year, the student presents a written summary of the research progress and plans to the advisory committee. Continuation in the program depends on the advisory committee's positive evaluation of the student's research progress.

Written and Oral Qualifying Examinations
Prior to advancement to candidacy, students must complete both parts of a qualifying examination. Part I consists of the preparation of a research proposal, to be written in the form of a grant proposal, including literature review, description of methods and experimental plans for the dissertation. This proposal should outline the research progress of the student to date and delineate the planned dissertation research aims and objectives. The written qualifying exam is administered by the research advisor. Part I is usually completed in the spring quarter of year 2 and no later than the fall quarter of year 3 of a student's graduate training. Part II consists of an oral comprehensive examination administered by a committee of five faculty members, at least one of whom is from outside the program. The student's research advisor does not serve on the oral qualifying committee. The oral comprehensive examination includes examination of the student's knowledge and understanding of material covered in the core courses and in the student's area of specialization. Part II must be completed no later than the end of year 3 of the student's graduate training.

Oral Qualifying Exam Modality
The Oral Qualifying Exam must be conducted and completed In-Person. Students are expected to present on campus with all committee members physically present. If the student is unavailable due to sickness or emergency circumstances, they will be required to reschedule the exam.

Exceptions:

To reduce the chances of rescheduling the oral exam due to committee member availability, an exception will be granted to permit one committee member (including the chairperson) to participate remotely (via secured video conferencing). The remaining members and the student must attend in-person. This exception will only be granted for faculty members unable to physically be present, due to personal/family sickness or emergency travel.

If the chairperson is remote, one of the in-person committee membres will assist with the tasks of the chairperson.

Research Project, Dissertation and Final Oral Examination
After successful completion of the qualifying exams and advancement to candidacy, the student completes the research project, submits a written dissertation, and defends the dissertation in a final oral examination.

Final Defense Modality
The Final Defense must be conducted and completed In-Person on campus. Students are expected to present on campus with all committee members physically present. If the student is unavailable due to sickness or emergency circumstances, they will be required to reschedule the exam.

Exceptions:

To reduce the chances of rescheduling the final defense due to committee member availability, an exception will be granted to permit one committee member (including the chairperson) to participate remotely (via secured video conferencing). The remaining members and the student must attend in-person. This exception will only be granted for faculty members unable to physically be present, due to personal/family sickness or emergency travel.

If the chairperson is remote, one of the in-person committee membres will assist with the tasks of the chairperson.

Students can request remote/virtual participation of family members and guests for the final exam. The defnese session will need to be scheduled in a video enabled room; it's the responsibility of the student to make the proper arrangements.

Modality exceptions may be granted by Graduate Advisor only in special cases. A formal petition will need to be submitted and approved by the graduate advisor.

Committee Members nominated from outside the UC Academic Senate must have qualifications comporable to a UC Academic Senate member and submit a letter of intention and CV. In addition, strong academic justification for the inclusion on the committee must be provided by the Graduate Advisor.

Normative Time to Degree 15 quarters

M.D.–Ph.D. Combined Degree

Admission
The combined degree is offered to students admitted to the medical school and to exceptional students from other four-year LCME-accredited medical schools. Normally, a student completes the first two years of medical school, and then spends approximately three years in the Ph.D. part of the program before completing the M.D. degree. However, the track is also offered to students who have completed the M.D. degree. UCR Biomedical Sciences students may apply for admission concurrently with their applications to the medical school or any time after acceptance to the medical school. For these students only, the MCAT is accepted in lieu of the GRE.

Students from other medical schools should apply in the fall of their sophomore or senior year. Applications from sophomores must be accompanied by official permission for an appropriate leave of absence. The GRE requirement is the same as for regular Ph.D. students.

Master's Degree

The Biomedical Sciences Graduate Group offers an M.S. degree. Students may directly apply to the M.S. degree program with a rolling admissions deadline. Students in the Ph.D. degree program may also complete the M.S. program if the student's advisory committee decides the master's degree is an appropriate alternative to the Ph.D. degree anytime after the first year of graduate education. In both situations a Plan I (Thesis) or Plan II (Comprehensive Examination) M.S. degree is available. The decision of completing a Plan I or II M.S. degree is to be decided in consultation with the student and the student's Guidance Committee. The Guidance Committee and Individual Development Plan (IDP) will be formed at the time of enrollment.

Professional Development
Two quarters of BMSC 254 are required. Additional specific professional development courses will be determined in consultation with the student's Guidance Committee.

Course Work Core requirements:

1. **Two quarters of BMSC 252**
2. **Two quarters of BMSC 254**
3. **BMSC 299 (minimum of 8 Units Directed Research)**
4. **Two quarters selected from any category in the following list:**
   - i) BMSC 222 - Special Topics
   - ii) BMSC 223
   - iii) MDCL 231, 232, 233, 234, 235
   - iv) BMSC 260A, B, C
   - v) Designated Emphasis - Cell Molecular and Behavioral Neuroscience Courses (CBNS 106, CBNS 116, CBNS 120, CBNS 125, CBNS 126, CBNS 127, CBNS 129, PSYC 112, PSYC 117, PSYC 203B, PSYC 207C, PSYC 208)
   - vi) Designated Emphasis - Inflammation and Infectious Disease Courses BMSC 223E, BMSC 236, MCBL 124, MCBL 202, MCBL 221)
   - vii) Designated Emphasis - Mechanisms

of Gene Expression and Regulation Studies Courses (BPSC 148, BPSC 234, CMDB 201, CMDB 203, CS 234, CS 238, EEOB 214, EEOB 216, ENTX 204, GEN 203, GEN 241, BEN 242, GEN 206, GEN 220, MCBL 221, STAT 100A).

A total of 36 units are required with normative time to degree 6 quarters. Teaching experience may be required based on consultation with the student's guidance committee.

Course Descriptions

All Biomedical Sciences courses are listed and described under Biomedical Sciences.

Further information regarding graduate studies in Biomedical Sciences may be obtained from medschool.ucr.edu/graduate.

Biophysics

Subject abbreviation: BPHY
See schedule of classes for courses

College of Natural and Agricultural Sciences

Roya Zandi, Ph.D., Program Director
Program Office: 1140 Batchelor Hall
(800) 735-0717 or (951) 827-6746
biophysics.ucr.edu

Professors

Mark Alber, Ph.D. ***Distinguished*** *Mathematics*
Kurt Anderson, Ph.D. *Evolution, Ecology, and Organismal Biology*
Bahman Anvari, Ph.D. *Bioengineering*
Boris Baer, Ph.D. *Entomology*
Chia en Chang, Ph.D. *Chemistry*
Meng Chen, Ph.D. *Cell Biology*
Xinping Cui, Ph.D. *Statistics*
Richard Debus, Ph.D. *Biochemistry*
Li Fan, Ph.D. *Biochemistry*
Theodore Garland, Jr., Ph.D. ***Distinguished*** *Evolution, Ecology, and Organismal Biology*
Adam Godzik, Ph.D. *Biomedical Sciences*
Venugopala Gonehal, Ph.D. *Botany and Plant Sciences*
Russ Hille, Ph.D. ***Distinguished*** *Biochemistry*
Richard Hooley, Ph.D. *Chemistry*
Darrel Jenerette, Ph.D. *Botany and Plant Sciences*
Zhenyu (Arthur) Jia, Ph.D. *Botany and Plant Sciences*
Ryan Julian, Ph.D. *Chemistry*
Bai-Lian Li, Ph.D. *Botany and Plant Sciences*
Jiayu Liao, Ph.D. *Bioengineering*
Bahram Mobasher, Ph.D. *Physics and Astronomy*
Umar Mohideen, Ph.D. *Physics and Astronomy*
Leonard Mueller, Ph.D. *Chemistry*
Scott Pegan, Ph.D. *Innate Immunity*
Maurizio Pellucchia, Ph.D. *Biomedical Sciences*
Jikui Song, Ph.D. *Biochemistry*
Yinsheng Wang, Ph.D. *Chemistry*
Roya Zandi, Ph.D. *Physics and Astronomy*

Associate Professors

John Barton, Ph.D. *Physics and Astronomy*
Gregor Blaha, Ph.D. *Biochemistry*
Weitao Chen, Ph.D. *Mathematics*
Joseph Genereux, Ph.D. *Chemistry*
Thomas Kuhlman, Ph.D. *Physics and Astronomy*
Dawn Nagel, Ph.D. *Botany and Plant Sciences*
Sean O'Leary, Ph.D. *Biochemistry*
Giulia Palermo, Ph.D. *Bioengineering*
Carolyn Rasmussen, Ph.D. *Botany and Plant Sciences*
Qixuan Wang, Ph.D. *Mathematics*
Linlin Zhao, Ph.D. *Chemistry*

Assistant Professors

Barbara Bar-Imhoof, Ph.D. *Entomology*
Sonali Chaturvedi, Ph.D. *Microbiology and Plant Pathology*
Wei-Chun Chou, Ph.D. *Environmental Sciences*
Vasileios Christopoulos, Ph.D. *Bioengineering*
Kevin Freedman, Ph.D. *Bioengineering*
Samuel Mann, Ph.D. *Chemistry*

Graduate Program

The program offers the M.S. and Ph.D. degree in Biophysics.

The interdepartmental graduate program in Biophysics has participating faculty from the departments of Biochemistry; Bioengineering; Biomedical Sciences; Botany and Plant Sciences; Chemistry; Evolution, Ecology and Organismal Biology; Mathematics; and Physics and Astronomy.

The goal of the program is to promote teaching, training and research in the field of Biophysics. Areas of specialization include biological electron transfer, computational/mathematical modeling of biological systems, structural biology, neurobiophysics, imaging and protein engineering. Biophysicists are needed by institutions of higher learning, and by federal, state and private research organizations.

Admission

Students must have a B.A. or B.S. degree in Biology, Biochemistry, Biophysics, Chemistry, Physics or in a related field from an accredited institution and an academic record that satisfies the minimum admission standards established by the UCR Graduate Division. Students admitted to regular standing will have satisfied all prerequisite course work. Under special circumstances, students who have not completed all undergraduate requirements may be admitted provided that the deficiencies are corrected early in their graduate studies. Undergraduate or other previous training must include the following coursework:

- One year of introductory biochemistry, including laboratory
- One year of introductory biology, including laboratory
- One year of introductory chemistry, including laboratory
- One year of organic chemistry, including laboratory
- One year of introductory physics, including laboratory
- One year of calculus, plus one upper division mathematics course

Students with strong academic records may be admitted with coursework deficiencies, provided they are remediated during the first two years of graduate study.

Doctoral Degree

The program offers the Ph.D. degree in Biophysics.

Course Work

Thirty-six (36) units of 100 or 200 series courses, of which at least twenty-four (24) units must be in the graduate 200 series; includes the program's graduate core curriculum and courses from a list of approved electives. A minimum of sixteen (16) units of coursework other than courses in the 290 series must be completed in fulfillment of the twenty-four (24) unit program requirement for graduate coursework.

All students are required to take a sequence of core courses (BCH 184, BCH 210, and PHYS 246) in their first year, and complete a series of research rotations in laboratories of participating faculty under BPHY 297 as part of the thesis advisor selection process. Participation in the Biophysics Graduate Seminar (BPHY 252) is also required for each quarter the student is enrolled; each student is expected to present a formal research seminar in this course prior to graduation. Students who present will receive a letter grade.

Approved Elective Courses include:

BCH 186, BCH 187, BCH 230F, BIEN 135, BIEN 142, BIEN 160, BIEN 165, BIEN 242, BIEN 245, BIEN 249, BIEN 251, CHEM 201A, CHEM 201B, CHEM 201C, CHEM 201D, CHEM 201E, CHEM 206A, CHEM 206B, CHEM 209M, CHEM 211D, CHEM 229Q, PHYS 145A, PHYS 145B, PHYS 145C, PHYS 212A, PHYS 212B

Comprehensive Examination

At the end of the first year, and no later than the end of the second year, students must pass a written comprehensive examination consisting of questions provided by the participating faculty, with topics taken from the core curriculum.

Qualifying Examination and Advancement to Candidacy

Doctoral students must complete a written research proposal based on their dissertation work and taking the form of a grant application to the National Science Foundation or National Institutes of Health. Once the proposal is deemed satisfactory, the student must pass an oral examination that will consist of a defense of the written research proposal before the student's qualifying exam committee. Upon successful completion of all coursework and passing of the Qualifying Examination, the student will advance to candidacy.

Dissertation

Students are expected to complete laboratory rotations and select a dissertation advisor by the end of their first academic year. The dissertation advisor will chair a Ph.D. Dissertation Committee that will meet annually to assess progress and provide input to the research project. A written dissertation will be completed by each student in the program.

Final Defense

Doctoral candidates will defend their dissertations in a public oral presentation at a time announced to members of the University community. The Dissertation Committee will then make a recommendation to the Graduate Division as to whether the degree of Ph.D. be conferred.

Oral Qualifying Exam and Final Defense Modality for the Ph.D. degree
The student, in agreement with their committee chairperson, will determine the modality for their Oral Qualifying Exam and final defense. The modalities will be as follows: **In-Person or Hybrid.**

Students taking the oral qualifying exam/presenting a final defense **in person** are expected to present on campus with all committee members physically present.

Students taking the oral qualifying exam/presenting a final defense **hybrid** have the option for some or all committee members/students to attend in person and some or all committee members/students to attend remotely.

The Hybrid options can be selected if the student or faculty member cannot attend in person due to travel or health reasons. The student, in agreement with their committee chairperson, will determine the modality.

Professional Development
Biophysics students must complete an annual research evaluation, complete a minimum of 2 quarters as a teaching assistant, and complete GDIV 403.

Normative Time to Degree
15 quarters

Master's Degree

The program offers the M.S. degree in Biophysics.

Students will normally be admitted to the Ph.D. program. Upon advancement to candidacy for the Ph.D. degree the student may petition the Graduate Division for conferral of the M.S. degree.

Students enrolling in the master's degree in Biophysics must meet the requirements for the Plan II of the UCR Graduate Council, take core courses as described above and pass a Comprehensive Examination.

Plan II (Comprehensive Exam)
Thirty-six (36) units of 100 or 200 series courses, of which at least eighteen (18) units must be in the graduate 200 series; includes the program's graduate core curriculum and courses from a list of approved electives. Students must enroll in BPHY 252 each quarter offered. Students must pass a three-hour Comprehensive Examination consisting of questions provided by the participating faculty, with topics taken from the core-curriculum.

Professional Development
Biophysics students must complete GDIV 403.

Normative Time to Degree
6 quarters

Graduate Courses

BPHY 250 Advanced Topics in Biophysics 2 Seminar, 2 hours. Prerequisite(s): restricted to major(s) Biophysics; graduate standing; or consent of instructor. Addresses advances in a particular field of Biophysics by analysis of the recent literature. Students who present a seminar receive a letter grade; other students receive a Satisfactory(S) No Credit grade. Course is repeatable as content or topic changes.

BPHY 252 Seminar in Biophysics 1 Seminar, 1 hour. Prerequisite(s): restricted to major(s) Biophysics; graduate standing; or consent of instructor. Provides oral presentations by visiting scholars, faculty, and graduate students on current research in Biophysics. Students who present a seminar receive a letter grade; other students receive a Satisfactory(S) No Credit grade. Course is repeatable.

BPHY 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): restricted to major(s) Biophysics; graduate standing; or consent of instructor. Explores literature or research topics under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BPHY 296 Special Topics in Biophysics 1 to 2 Seminar, 1 to 2 hours. Prerequisite(s): restricted to major(s) Biophysics; graduate standing; or consent of instructor. Oral presentations and intensive small-group discussion of selected topics in the area of special competence of each participant. Emphasizes recent advances in topic area and content varies accordingly. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content or topic changes.

BPHY 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): restricted to major(s) Biophysics; graduate standing; or consent of instructor. Exploratory research toward the development of the dissertation problem or other research not specifically for thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BPHY 299 Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): restricted to major(s) Biophysics; graduate standing; or consent of instructor. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.



Black Study

Subject abbreviation: BLKS
College of Humanities, Arts, and Social Sciences

Anthony Jerry, Ph.D., Chair
Department of Black Study
1320c Watkins Hall
blackstudy@ucr.edu

Distinguished Professors
Dylan Rodriguez, Ph.D.

Professors
Sage Ni'Ja Whitson, M.F.A., M.F.A.W
Jaye Williams, M.F.A., PhD.
João H. Costa Vargas, Ph.D.

Associate Professors
El/yse Ambrose, Ph.D.
Anthony Jerry, Ph.D.
Imani Kai Johnson, Ph.D.
Vorris Nunley, Ph.D.
Sage Ni'Ja Whitson, M.F.A, M.F.A.W.

Assistant Professors
Desireé, Melonas, Ph.D.
Stephanie Jones, Ph.D.

Major Requirements

The major requirements for the B.A. degree in Black Study are as follows:

1. **Lower-division requirements (16 units)**
   a) BLKS 001
   b) BLKS 002
   c) BLKS 003
   d) BLKS 004
2. **Upper-division requirements (16 units)**
   a) BLKS 191A or BLKS 191B
   b) BLKS 193A and BLKS 193B (Senior Capstone)
   c) BLKS 195
3. **Additional Courses (24 units) Students must take at least six (6) courses from two of the streams below**
   1) **STREAM ONE: Critical Study in Black Lives**
   BLKS 019/RLST 019, BLKS 101, BLKS 111, BLKS 115/RLST 115, BLKS 118/POSC 131, BLKS 142, BLKS 145/EDUC 145
   2) **STREAM TWO: Arts, Cultures, and Imagination**
   BLKS 024, BLKS 114, BLKS 121, BLKS 122, BLKS 123/SFSC 123, BLKS 124
   3) **STREAM THREE: Behavioral Sciences, Social Sciences, and Pasts**
   BLKS 118/POSC 131, BLKS 131, BLKS 132, BLKS 142
   4) **STREAM FOUR: Building Black Liberation**
   BLKS 024, BLKS 124, BLKS 144, BLKS 151

Minor Requirements

The major requirements for the minor in Black Study are as follows:

1. **Students must take at least two (2) of the following lower-division courses (8 units)**
   a) BLKS 001
   b) BLKS 002
   c) BLKS 003

d) BLKS 004

2. **Upper-division requirements (8 units)**
   a) BLKS 191A or BLKS 191B
   b) BLKS 195
3. **Additional Courses (12 units) Students must take at least three (3) courses from two of the streams below**
   1) **STREAM ONE: Critical Study in Black Life and Lives**
   BLKS 019/RLST 019, BLKS 101, BLKS 111, BLKS 115/RLST 115, BLKS 118, BLKS 142, BLKS 145/EDUC 145
   2) **STREAM TWO: Arts, Cultures, and Imagination**
   BLKS 024, BLKS 114, BLKS 121, BLKS 122, BLKS 123/SFSC 123, BLKS 124
   3) **STREAM THREE: Behavioral Sciences, Social Sciences, and Past**
   BLKS 118, BLKS 131, BLKS 132, BLKS 142
   4) **STREAM FOUR: Building Black Liberation**
   BLKS 024, BLKS 124, BLKS 144, BLKS 151

Lower-Division Courses

BLKS 001 Introduction to Black Study 1: Black People Domestically and Globally Now 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Introduces social issues and movements impacting Black peoples globally. Studies creation of possibilities to navigate issues (e.g., AIDS and other pandemics, food and nutrition insecurity, state terror and industrial incarceration, residential segregation, exposure to environmental toxins, and health and education inequities) to create vibrant futures. Credit is awarded for one of the following BLKS 001 or BLKS 001S.

BLKS 001S Introduction to Black Study 1: Black People Domestically and Globally Now 5 Lecture, 3 hours; discussion, 1 hour; activity, 3 hours; extra reading, 1 hour. Introduces social issues and movements impacting Black peoples globally. Studies creation of possibilities to navigate issues (e.g., AIDS and other pandemics, food and nutrition insecurity, state terror and industrial incarceration, residential segregation, exposure to environmental toxins, and health and education inequities) to create vibrant futures. Credit is awarded for one of the following BLKS 001S or BLKS 001.

BLKS 002 Introduction to Black Study 2: Imagined and Embodied Futures 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Engages critical appraisal of artistic forms, political organizing efforts, embodied praxis and resistance formations, and theoretical prisms that imagine and propose alternatives to antiblackness. Examines Black interventions through time and technologies focusing on transgender, queer, and feminist perspectives-building on what Cedric Robinson terms the Black Radical Tradition. Credit is awarded for one of the following BLKS 002 or BLKS 002S.

BLKS 002S Introduction to Black Study 2: Imagined and Embodied Futures 5 Lecture, 3 hours; discussion, 1 hour; activity, 3 hours; extra reading, 1 hour. Engages critical appraisal of artistic forms, political organizing efforts, embodied praxis and resistance formations, and theoretical prisms that imagine and propose alternatives to antiblackness. Examines Black interventions through time and technologies focusing on transgender, queer, and feminist perspectives-building on what Cedric Robinson terms the Black Radical Tradition. Credit is awarded for one of the following BLKS 002S or BLKS 002.

BLKS 003 Introduction to Black Study 3: Black Ways of Knowing, Doing, and (b)eing Otherwise 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Engages epistemology, the nature of knowledge and how knowledge relates to the concept of the human. Explores what counts as knowing and knowledge through Radical Black Study. Seeks to understand not why black lives matter but why black life matters. Examines what Cedric Robinson calls "The Terms of Order." Credit is awarded for one of the following BLKS 003 or BLKS 003S.

BLKS 003S Introduction to Black Study 3: Black Ways of Knowing, Doing, and (b)eing Otherwise 5 Lecture, 3 hours; discussion, 1 hour; activity, 2 hours; extra reading, 1 hour. Engages epistemology, the nature of knowledge and how knowledge relates to the concept of the human. Explores what counts as knowing and knowledge through Radical Black Study. Seeks to understand not why black lives matter but why black life matters. Examines what Cedric Robinson calls "The Terms of Order." Credit is awarded for one of the following BLKS 003S or BLKS 003.

BLKS 004 Introduction to Black Study 4: Praxis, Imagination, and Innovation 4 Lecture, 1 hour; laboratory, 2 hours; studio, 3 hours; individual study, 2 hours; screening, 1 hour; extra reading, 1 hour. Prerequisite(s): restricted to major(s) Black Study; or consent of instructor. Engages in art making as critical research and strategy in liberatory world-making. Examines Black futures as radically imagined by artists and as a point of departure for interdisciplinary creative projects. Encourages an embrace of the personal, ancestral, sacred, political, and beyond.

BLKS 019 Black Religion in the United States 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to religion in the experiences of Black people in the United States. Topics include Black religion in the social imagination, in ritual, the arts (e.g., African American spirituals, literature), Black Nationalism, social change, and queernesses in Black religion. Engages primary sources for examining religious contributions in society. Cross-listed with RLST 019.

BLKS 024 Black Social Dance and Movement(s): 1 2 or 4 Workshop, 3 hours; activity, 4 or 9 hours. Explores the fundamentals of Black and African Diasporic social dance including the practices that utilize embodied organization. Focuses on a range of dance and movement forms that engages presentational and non-presentational forms inextricable from Black cultural and political life. Course is repeatable to a maximum of 8 units.

Upper-Division Courses

BLKS 101 Critical Theories of Gender, Race, and Blackness 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines critical theories on the intersections of gender, race, and Blackness. Explores analytical and political implications of such theories and interrogates relations to traditional disciplinary canons and existing forms of political organizing. Probes continuities and ruptures between our planetary contemporary political moment and the cognitive apparatus that transatlantic slavery realized.

BLKS 111 Troublesome Possibilities: Reality, Black Aliveness, and Becoming 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines critical terms and concepts central to Black study and its connection to Black becoming, Black aliveness, and Black life. Topics include anti-blackness, the fungible, fugitivity, slavery's afterlife, neoliberalism, miserablism, social death, microaggressions, Black spirituality, the dark feminine, Trans and Queer epistemologies, unfreedom, interlocking oppressions, racial capitalism, and Black rhetoric.

BLKS 114 Black Healing Traditions 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores healing traditions as religious experiences and technologies for countering oppressive social conditions and human precarity. Examines the role of black healing traditions in disruptingnormative ideas of Black Religion and liberation. Interrogates commodification of black healing in the United States.

BLKS 115 Black Religion, Resistance, and Moral Imagination 4 Lecture, 4 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A survey of various figures and communities that have resisted hegemonic norms in Black religion in the United States. Explores historical primary resources, literature, oral histories, and contemporary artistic and cultural productions. Examines moral visions of Black and collective resistance and thriving. Cross-listed with RLST 115.

BLKS 118 Black Political Thought 4 Lecture, 3 hours; extra reading, 1 hour; activity, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines approaches and evaluates what is at stake in engaging and producing Black political thought. Focuses on to the Black experience in the context of the United States but also covers African and Caribbean thinkers. Topics include freedom, democracy, liberation, futurity, community, radical imagining, and

state-sanctioned violence. Cross-listed with POSC 131.

BLKS 120 Black Feminism and the Sacred 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines black feminist personal, political, and academic approaches to studying and enlivening the sacred. Considers new questions a black feminist lens raises, disrupts, untethers, and builds. Investigates ethics, race, gender, sexuality, class, the arts, aliveness, and futurity supplemented with student-led explorations of contemporary black feminist expressions of the sacred.

BLKS 121 The Body & the Flesh in Black Thought 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores theories of the flesh and the body in Black thought to understand the multiple ways that Black bodies signify in the world. Examines flesh, epidermalization, embodiment, and other concepts that consider both antiblack perspectives and theories rooted in and routed through Black radical imagination and praxes.

BLKS 122 House Dance and Futurist Cypher Technologies 4 Workshop, 3 hours; activity, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Studies Black and Queer improvisatory social and spiritual practices related to the Diasporic technologies of the circle. Highlights the ring shout as foundational for unlocking structures, sacred, and corporeal liturgies embedded within Black trance-inducing social dance forms. Explores the musical grounding of the Black Queer form within this spiritual lineage.

BLKS 123 Reclaiming the Dark: Black Life Is Speculative Fiction 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores alternative states of being, doing, and imagining in, around, and through Black life and culture. Covers writers, artists, and activists such as Octavia Butler, Toni Morrison, Cedric Robinson, the Combahee River Collective, N. K. Jemisin, Adrienne Maree Brown, Kevin Quashie, Nnedi Okorafor, and Ursula K. Le Guin. Cross-listed with SFCS 123.

BLKS 124 Black Social Dance and Movement(s): 2 2 or 4 Workshop, 3 hours; activity, 4 or 9 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores the fundamentals of Black and African Diasporic social dance and practices that utilize embodied organization. Focuses on a range of dance and movement forms. Engages presentational and non-presentational forms that are inextricable from Black cultural and political life.

BLKS 131 Blackness in the Social Sciences 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores how different disciplines within the social sciences have approached Blackness and how Black social scientists have impacted the theoretical and analytical frameworks of these disciplines.

BLKS 132 Black Diaspora(s) 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Focuses on how diverse histories of colonialism, nation state building, enslavement, and social relations around Blackness combined with historical trajectories of regional social, political, and economic development create regional experiences of Blackness. Traces forms of being and modes of resistance among diasporic Black communities to understand broader Black diasporic experience. Course is repeatable as content or topic changes to a maximum of 8 units.

BLKS 135 Incarcerated Black Radicalisms 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Engages the political and cultural work of incarcerated Black radical and proto-radical intellectuals in the twentieth and early twenty-first century. Examines how this Black intellectual lineage catalyzes reevaluations, destructions, counter-occupations, abolitions, and transformations of the U.S. nation-state including its durable regimes of (antiblack) domestic and global war.

BLKS 142 Blackness and Carcerality 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): or consent of instructor. Examines the history, contemporary dynamics, key social theories, and social movements focusing on the criminal justice system. Addresses the vast apparatus of surveillance and punishment that constitute its lesser-known aspects including schools, hospitals, immigration detention centers, and various technologies.

BLKS 144 Artist Healers: Trans Indigenous Medicine and Art Intersections 4 Workshop, 3 hours; lecture, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines a range of contemporary live performance makers and healers (centered in trans-indigeneity) who call to question the construction of norms, binaries, borders, and being. Focuses on healing modalities and positioning wellness, as well as political and critical engagement as partners in accessing a radical imaginary.

BLKS 145 Black Language in Schools and Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores linguistic, sociolinguistic, and sociopolitical dimensions of Black language in the United States. Considers the relationship between Black language and Blackness. Critically interrogates the role of Black language in classroom instruction, schools, and society. Encourages liberatory learning engagements and centers the lived experiences of Black language speakers. Cross-listed with EDUC 145.

BLKS 151 Afrological Improvisation 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines afrological improvisation, a diasporic artform and essential element of jazz. Presents key concepts, pertinent bibliography, and basic discography on jazz since 1950. Covers styles and performers which enables placement in political traditions that draw from Black collective knowledge and engage formations of state, society, and empire.

BLKS 155 Black Trans and Nonbinary World-Making 4 Workshop, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Includes a gathering of radical Queer imaginaries of Black Trans, Nonbinary, and Intersex Artists and Activists. Explores radical creativity to combat anti-trans cultures. Traverses the Spiritual, empowered, soft, speculative, and mysterious of embodied intelligences and inspired mobilization efforts.

BLKS 156 Special Topics in Art & Activism 4 Workshop, 3 hours; activity, 9 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Studies emerging issues in liberatory practices in performance, art, and activism. Focus varies by quarter. Topics may include: the conceptual and sacred; technology; worlding; un/worlding; art in and beyond the museum; techniques of mobilization; movement work and workers; subcultures in Black freedom movements and art. Course is repeatable to a maximum of 8 units.

BLKS 191A Black Study Transdisciplinary Research Methods 1: Gateways to Inquiry 4 Seminar, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduces interdisciplinary and transdisciplinary research approaches to study questions to attend to the lives of Black folk around the world. Covers traditional and experimental methodologies focusing on contemporary research practices and methods deriving from Black diasporic epistemologies. Prepares for the beginning stages of research for senior projects.

BLKS 191B Black Study Transdisciplinary Research Methods 2: Practicing Inquiry 4 Seminar, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): BLKS 191A; or consent of instructor. Engages practical use of research practices, methods, and epistemologies introduced in BLKS 191A. Facilitates design of research questions and projects for senior capstone project as well as further exploration of the role of researcher.† Focuses on research development skills and field-based concentrations. Helps identify relevant theoretical frameworks and bibliographies.

BLKS 193A Black Study Senior Capstone 1 4 Seminar, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): BLKS 191A with a grade of C- or better or BLKS 191B with a grade of C- or better; or equivalent; a transdisciplinary research plan must be approved; and consent of instructor. Facilitates initiation of a transdisciplinary capstone project drawing on methods and practices learned in the Black Study major. Applies research and critical writing methods, performance and embodied praxis, and knowledge of visual cultures and media. Provides mentorship for research, writing, and revision processes.

BLKS 193B Black Study Senior Capstone 2 4 Seminar, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): BLKS 193A with a grade of C- or better; or equivalent; restricted to class level standing of senior; or consent of instructor. Continues transdisciplinary capstone project drawing on methods and practices learned in Black Study major. Applies research and critical writing methods, performance and embodied praxis, and knowledge of visual cultures and media. Provides mentorship for research, writing, and revision processes. Focuses on research and writing skills, peer reviews, and field-based work.

BLKS 195 Black Study Inland Empire Community Initiative 4 Seminar, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): BLKS 001, BLKS 002, BLKS 003; restricted to class level standing of junior, or senior; or consent of instructor. Introduces community engagement including prevention of social problems and promotion of well-being in diverse contexts. Critically examines how to define and propose solutions to social and institutional problems. Covers empowerment, resilience, diversity, cultural competence, and social action. Involves service learning through community organizations in Inland Empire communities. Course is repeatable to a maximum of 8 units.

BLKS 196 Directed Research Or Creative Activity in Black Study 4 Seminar, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): BLKS 001, BLKS 002, BLKS 003; or equivalent; restricted to class level standing of junior, or senior; and consent of instructor. Concentrated, in-depth study with a faculty member. Enables conduct of interdisciplinary research in one or two of the upper-division track concentrations in the Black Study major. Course is repeatable to a maximum of 8 units.

Graduate Courses

BLKS 200 Dark Matter and Black Time 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Addresses ways in which combinations of Afrofuturism, Quantum time, Black Speculative Arts, and Astrophysics create new understandings of Blackness in studies of time, posthumanism, and transhumanism. Explores the Spirit within the Black [dark] and Dark [black] within embodied Black Futurist practice.

BLKS 201 Four Page Letters and Four Letter Words 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Explores writing from the future and to the future as statements or embodiments of protest, as maps for our liberation, as a pulse to inspire our collective and individual action. Inspired by Ashon Crawley's The Lonely Letters, we will explore from social media, protest signage, visual art, and performance.

BLKS 202 Manuscript Lab 4 Workshop, 3 hours; lecture, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. An intensive course to support work in developing a thesis or manuscript. Encourages the pedagogical approach of the workshop laboratory and models the praxis. Course is repeatable to a maximum of 8 units.

BLKS 203 Critical Topics in Art and Activism 4 Workshop, 3 hours; activity, 9 hours. Prerequisite(s): graduate standing; or consent of instructor. Analyzes movements of Black practitioners of multiple modalities. Includes the intersection between the conceptual and sacred; technology; worlding and un-worlding; embodying performance; art in and beyond the museum; studies in the techniques of mobilization; movement work and workers; and cultures and subcultures in Black freedom movements and art. Course is repeatable as content or topic changes to a maximum of 8 units.

BLKS 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; or consent of instructor. Faculty-directed study of specialty areas and topics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BLKS 292 Concurrent Studies 1 to 4 Research, 3 to 12 hours. Prerequisite(s): graduate standing; and consent of instructor. Provides an individualized set of outside research activities, requirements and evaluation of methods devised by the professor teaching the 100-series Black Study course being taken concurrently. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 12 units.

BLKS 297 Directed Research in Black Study 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing; or consent of instructor. Independent study work including one-on-one critiques by the supporting faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BLKS 299 Thesis Or Dissertation Research 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing; or consent of instructor. Includes an individualized set of outside research activities, requirements, and evaluation methods mutually determined between the faculty member and student. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.



Botany and Plant Sciences

Subject abbreviation: BPSC, GNBT
College of Natural and Agricultural Sciences

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Department Office, 2132 Batchelor Hall
(951) 827-4619
Graduate Student Affairs (800) 735-0717 or (951) 827-5688
CNAS Undergraduate Advising Center (951) 827-7294 or (951) 827-3102

Professors

Julia N. Bailey-Serres, Ph.D. *Distinguished Professor of Genetics*
Meng Chen, Ph.D. *Cell Biology*
Sean Cutler, Ph.D. *Distinguished Professor of Plant Cell Biology*
Katayoon Dehesh, Ph.D. *Distinguished Professor of Molecular Biochemistry*
Thomas A. Eulgem, Ph.D. *Plant Cell Biology*
Exequiel Ezcurra, Ph.D. *Distinguished Professor of Ecology*
Thomas Girke, Ph.D. *Bioinformatics*
Venugopala R. Gonehal, Ph.D. *Plant Cell Biology*
Darrel Jenerette, Ph.D. *Landscape Ecology*
Zhenyu Jia, Ph.D. *Quantitative Genetics*
Bai-Lian "Larry" Li, Ph.D. *Plant Ecology*
Adam J. Lukaszewski, Ph.D. *Genetics*
David Nelson, Ph.D. *Genetics*
Carolyn G. Rasmussen, Ph.D. *Plant Cell Biology*
Louis Santiago, Ph.D. *Physiological Ecosystems Ecology*
Patricia S. Springer, Ph.D. *Genetics*
Linda L. Walling, Ph.D. *Genetics*
Shizhong Xu, Ph.D. *Distinguished Professor of Genetics*

Professors Emeriti

Edith B. Allen, Ph.D. *Community/Restoration Ecology*
Timothy J. Close, Ph.D. *Genetics*
Darleen A. DeMason, Ph.D. *Botany*
Norman C. Ellstrand, Ph.D. *Distinguished Professor of Genetics*
Janet Franklin, Ph.D. *Distinguished Professor of Biogeography*
Arturo Gómez-Pompa, Ph.D. *Botany*
Anthony E. Hall, Ph.D. *Plant Physiology*
Robert L. Heath, Ph.D. *Plant Physiology and Biophysics*
Jodie S. Holt, Ph.D. *Plant Physiology*
Anthony H. C. Huang, Ph.D. *Plant Physiology*
Elizabeth M. Lord, Ph.D. *Botany/Developmental Biology*
Carol J. Lovatt, Ph.D. *Plant Physiology*
Eugene A. Nothnagel, Ph.D. *Plant Physiology*
Natasha Raikhel, Ph.D. *Distinguished Professor of Plant Cell Biology*
Mikeal L. Roose, Ph.D. *Genetics*
Irwin P. Ting, Ph.D. *Plant Physiology*
J. Giles Waines, Ph.D. *Genetics*
Susan Wessler, Ph.D. *Distinguished Professor of Genetics*

Associate Professors

Juan Pablo Giraldo, Ph.D. *Plant Physiology*
Loralee Larios, Ph.D. *Plant Ecology*
Amy Litt, Ph.D. *Plant Evolution and Development*
Dawn Nagel, Ph.D. *Genetics and Genomics*

Assistant Professors

Christopher P. Catano, Ph.D. *Plant Ecology*
Adam Jozwiak, Ph.D., *Molecular Biochemistry*
Daniel Koenig, Ph.D. *Genetics*
Sunil Kenchanmane Raju, Ph.D. *Plant Resilience*
Danelle Seymour, Ph.D. *Genetics*

Professors of Extension

Mary Lu Arpaia, Ph.D. *Subtropical Horticulture*
James Baird, Ph.D. *Turfgrass Horticulture*
Ashraf El-Kereamy, Ph.D. *Subtropical Horticulture*
Peggy A. Mauk, Ph.D. *Subtropical Horticulture*
Milton E. McGiffen, Jr., Ph.D. *Vegetable Crops/Plant Physiology*
Donald J. Merhaut, Ph.D. *Horticulture and Floriculture*
Philippe E. Rolshausen, Ph.D. *Subtropical Crops*

Cooperating Faculty

Jorge Ferreira, Ph.D. (USDA Salinity Lab)
Simon "Niels" Groen, Ph.D. (Nematology)
Bao-Lam Huynh, Ph.D. (Nematology)
Hailing Jin, Ph.D. (Microbiology and Plant Pathology)
Robert Jinkerson, Ph.D. (Chemical and Environmental Engineering)
Isgouhi Kaloshian, Ph.D. (Nematology)
Kerry Mauck, Ph.D. (Entomology)
Olakunle Olawole (Microbiology and Plant Pathology)
Erin Wilson Rankin, Ph.D. (Entomology)
Joel Sachs, Ph.D. (Evolution, Ecology and Organismal Biology)
Devinder Sandhu, Ph.D. (USDA Salinity Lab)
Jason Stajich, Ph.D. (Microbiology and Plant Pathology)
Ian Wheeldon, Ph. D. (Chemical and Environmental Engineering)
Tingting Xiang (Bioengineering)

Major

The mission of the interdepartmental Undergraduate Program in Plant Biology is to provide students with a solid background in modern principles and research practices of basic Plant Biology and in their area of specialization.

Courses prerequisite to the major, courses used to satisfy major requirements, and the 11 units (for B.S. degree) related to the major must be taken for letter grades. Students may elect to take other courses on a Satisfactory (S)/No Credit (NC) basis. Refer to the Academic Regulations section of this catalog for additional information on "S/NC" grading.

Information about this program is available on the CNAS UAAC website at cnasstudent.ucr.edu.

Transfer Students

Students planning to transfer to UCR with a major in Plant Biology must have a minimum GPA of 2.7 in transferable college courses and "C" or higher grades in a year sequence of general chemistry and in courses equivalent to our BIOL 005A, BIOL 005B. We also require that transfer students complete two quarters of college calculus (equivalent to our MATH 007A and 007B or our MATH 009A and MATH 009B) before admission. Exceptions may be granted by the faculty advisor.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

Major Requirements

The major requirements for the B.S. and B.A. degrees in Plant Biology are as follows:

1. **Life Sciences core requirements (72-77 units)**

   Students must complete all required courses with a grade of "C-" or better and with a cumulative GPA in the core courses of at least 2.0. Grades of "D" or "F" in two core courses, either separate courses or repetitions of the same course, are grounds for discontinuation from the major.

   a) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C

   b) CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, CHEM 01LC

   c) CHEM 008A and CHEM 08LA or CHEM 008HA and CHEM 008HLA, CHEM 008B and CHEM08LB or CHEM 008HB and CHEM 008HLB, CHEM 008C and CHEM 08LC or CHEM 008HC and CHEM 08HLC

   d) MATH 007A or MATH 009A, MATH 007B or MATH 009B (MATH 009C recommended)

   e) PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB, PHYS 002C, PHYS 02LC

   f) STAT 010

   g) BCH 100 or BCH 110A (BCH 110A is strongly recommended)

2. **Upper-division requirements (38 units for the B.S., 33 units for the B.A.)**

   A GPA of at least 2.0 in upper-division courses taken in the field of the major is a graduation requirement. A student is subject to discontinuation from the major whenever the GPA in upper-division course work is below 2.0. Students finding themselves in this circumstance must meet with an advisor.

   a) BIOL 102

   b) BPSC 104/BIOL 104

   c) BIOL 132/BPSC 132, BIOL 143/BPSC 143, BPSC 133

   d) For the B.S. only: Two (2) units of BPSC 195H, BPSC 197, BPSC 198I, or BPSC 199

   e) BPSC 184

   f) BPSC 193 with a grade of C- or better

   g) **For the B.S.** At least 11 additional units from one of the five areas of specialization (consult with a faculty advisor). Students may apply a maximum of 6 units of BPSC 190 and/or BPSC 195H and/or BPSC 197 and/or BPSC 198I and/or BPSC 199.

   For the B.A. At least 8 additional units

from one of the five areas of specialization (consult with a faculty advisor).

Note: Students planning a B.A. degree should schedule the required language courses in place of a series of electives.

Areas of Specialization

Individual student career goals may be achieved by selecting an area of specialization within the diverse disciplines of botany and plant sciences. Adjustments within these programs can be made to accommodate students' interests. Students must consult with a faculty advisor to clarify educational goals and to plan a program of study.

1. **Plant Cellular, Molecular, and Developmental Biology**
   a) BPSC 135
   b) Additional units from the following to meet either the B.S. or B.A. requirement: BCH 102,BCH 110B, BCH 110C or BIOL 107A, BCH 162, BCH 183/BPSC 183, BIOL 107B, BIOL 113, BIOL 114, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, MCBL 121LS, BIOL 123/MCBL 123/PLPA 123, BIOL 155/BPSC 155, BIOL 168, BPSC 138/BIOL 138, CBNS 101, CBNS 108, BPSC 109/CBNS 109, BPSC 149
2. **Plant Genetics, Breeding, and Biotechnology**
   a) BPSC 150
   b) Additional units from the following to meet either the B.S. or B.A. requirement:
   BIOL 105, BIOL 107A, BIOL 107B, BIOL 108, BIOL 119, BIOL 148/BPSC 148, BIOL 155/BPSC 155, BPSC 135, CBNS 108, STAT 011, BPSC 109/CBNS 109, BPSC 149
3. **Ecology, Evolution, and Systematics**
   a) BPSC 146
   b) Additional units from the following to meet either the B.S. or B.A. requirement:
   BIOL 105, BIOL 108, BIOL 112/BPSC 112/ENTM 112, BIOL 116, BIOL 116L, BIOL 138/BPSC 138, BIOL 165/BPSC 165, BPSC 134/ENSC 134, BPSC 166, ENSC 100, GEO 151, GEO 153, GEO 169, BPSC 145
4. **Plant Pathology, Nematology, and Pest Management**
   a) BIOL 120/MCBL 120/PLPA 120
   b) Additional units from the following to meet either the B.S. or B.A. requirement:
   BCH 183/BPSC 183, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, MCBL 121LS, BIOL 124/MCBL 124, BPSC 146, BPSC 150, BPSC 166, ENSC 134/BPSC 134, ENTM 100/BIOL 100, ENTM 109, ENTM 124, ENTM 127/BIOL 127, ENTM 129, ENTM 129L, ENSC 100, ENSC 120/NEM 120, NEM 159/BIOL 159, PLPA 120L/BIOL 120L/MCBL 120L, PLPA 123/BIOL 123/MCBL 123, PLPA 134/BIOL 134, PLPA 134L/BIOL 134L, ENSC 104, MCBL 128
5. **Individualized specialization**
   For students who wish to pursue cross-disciplinary education in plant biology. Course selection can be individualized, but needs to be approved by faculty advisor.

Minor

The minor in Plant Biology allows students majoring in other departments to obtain in-depth training in Plant Biology.

Requirements for the minor in Plant Biology are as follows:

1. BIOL 104/BPSC 104 (4 units)
2. One course (4–5 units) from the following: BIOL 132/BPSC 132, BIOL 138/BPSC 138, BIOL 143/BPSC 143, BPSC 133
3. 12 to 20 units from the following: BCH 183/BPSC 183, BIOL 132/ BPSC 132, BIOL 138/BPSC 138, BIOL 143/ BPSC 143, BIOL 148/BPSC 148, BIOL 155/ BPSC 155, BIOL 165/BPSC 165, BPSC 133, BPSC 134/ENSC 134, BPSC 135, BPSC 146, BPSC 150, BPSC 166, BPSC 190, BPSC 195H, BPSC 197, BPSC 198-I, BPSC 199, PLPA 120/BIOL 120/MCBL 120, BPSC 109/CBNS 109, BPSC 149

Note: No more than 4 units of BPSC 190–199 may be used to fulfill this requirement. The course used to fulfill the requirement in 2 cannot also be used to fulfill the requirement in 3.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Graduate Program

The Department of Botany and Plant Sciences offers programs leading to the M.S. and Ph.D. degrees in Plant Biology. Research in these programs can focus on basic and/or applied questions.

Admission

Applicants who have a baccalaureate degree and who satisfy the general requirements of the university listed in the Graduate Studies section of this catalog are considered for admission to graduate status. Students applying to the M.S. and Ph.D. program must submit GRE General Test scores (verbal, quantitative, and analytical).

Regardless of the area of their major for the baccalaureate degree, students must have had, or complete soon after entering graduate school the following:

1. A year of course work in general biology
2. A year of course work in general chemistry
3. A course in genetics
4. A course in biochemistry or ecology
5. A course in calculus
6. Two courses in physics and/or statistics

Credit from these courses does not count toward the graduate degree.

Immediately after being admitted, each student should identify a faculty advisor and consult with that advisor or the graduate advisor regarding educational goals; scheduling initial course work and possible lab rotations; and forming a guidance committee. Further guidance on these matters is provided in the Botany and Plant Sciences Graduate Student Handbook.

Master's Degree

The Department of Botany and Plant Sciences offers programs leading to the M.S. degree in Plant Biology.

The master's degree may be earned under Plan I (Thesis) or Plan II (Comprehensive Examination). Students must meet all general requirements of the Graduate Division. The detailed course program is determined by the guidance committee after considering the specific interests of the student. Department requirements are as follows:

Plan I (Thesis)

1. **Three courses from Section I are required.** Students who have taken courses comparable to those in Section I during their baccalaureate training may have a portion or all of this section waived. Recommendations for waivers should specify alternative courses and should be sent to the department educational advisory committee for approval. In such instances, however, it is expected that their programs include increased units in courses from Sections II, III, and/or IV.
2. **Two courses (6 units) from Section II are required.** In fulfilling the Section II requirement, students may use no more than one course cross-listed by Botany and Plant Sciences and another program. If such a cross-listed course is used toward fulfilling the Section II requirement, the same course may not be used toward fulfilling the Section I or III requirements. No more than four units may be in professional development courses.
3. **At least 6 units from Section III must be taken.**
4. **Preparation of a thesis: Not more than 12 units from Section V (299 units) may apply toward the degree.** If the student takes research courses (290/297) from Section IV, not more than 6 units may be applied toward the degree. A total of 12 units of 297/299 may be used towards the degree.

Seminar Requirement

All full-time students must enroll in the BPSC 250 seminar during each quarter in which it is offered. Part-time students must take one BPSC 250 seminar for every 12 units of courses. All students must present at least one BPSC 250 seminar and complete at least one quarter of BPSC 240 (or approved similar equivalent that involves substantial student presentations).

Plan II (Comprehensive Examination)

1. **Three courses from Section I are required.** Students who have taken courses comparable to those in Section I during their baccalaureate training may have a portion or all of this section waived. In such instances, however, it is expected that their programs include increased units in courses from Section II and/or III. Recommendations for waivers should specify alternative courses and should be sent to the educational advisory committee for approval.
2. **Two courses (6 units) from Section II are required.** In fulfilling the Section II requirement, students may use no more than one

course cross-listed by Botany and Plant Sciences and another program. If such a cross-listed course is used toward fulfilling the Section II requirement, the same course may not be used toward fulfilling the Section I or III requirements. No more than 4 units may be in professional development courses.

3. **At least 3 courses (11-12 units) from Section III are required.**
4. **Students must complete at least 6 units from Section IV for a research project (297) or literature review (290)**, which should be described in a report to be submitted for evaluation by the comprehensive examination committee.
5. **Comprehensive written and oral examinations**

Seminar Requirement
All full-time students must enroll in the BPSC 250 seminar during each quarter in which it is offered. Part-time students must take one BPSC 250 seminar for every 12 units of courses. All students must present at least one BPSC 250 seminar and complete at least one quarter of BPSC 240 (or approved similar equivalent that involves substantial student presentations).

Courses available for fulfilling the requirement for the M.S. degree in Plant Biology:

Section I — Upper-division undergraduate courses: BCH 183/BPSC 183, BIOL 104/BPSC 104, BIOL 112/BPSC 112/ ENTM 112, BIOL 120/MCBL 120/PLPA 120, BIOL 132/BPSC 132, BIOL 134/PLPA 134, BIOL 138/BPSC 138, BIOL 143/BPSC 143, BIOL 148/BPSC 148, BIOL 155/BPSC 155, BIOL 165/BPSC 165, BPSC 109/CBNS 109, BPSC 133, BPSC 134/ ENSC 134/, BPSC 135, BPSC 146, BPSC 148, BPSC 149, BPSC 150, BPSC 166

Section II — Graduate and upper-division undergraduate courses in related departments or programs and professional development courses (i.e., BPSC 200A - BPSC 200B). Applicable courses are approved by theGraduateEducational AdvisoryCommittee. A minimum of 6 units of course work is required. No more than 4 units may be from professional development classes.

Professional Development Training
Students are required to take BPSC 200A. Students are encouraged to enroll in BPSC 200B. Students may also enroll in BPSC 200C to develop skills in research mentoring in the life sciences.

Section III — BCH 231/BPSC 231, BPSC 201 (E-Z) (for a maximum of 2 units), BPSC 221, BPSC 222, BPSC 225 (E-Z), BPSC 230, BPSC 231, BPSC 234, BPSC 235, BPSC 239, BPSC240 (only if taken in addition to the required seminar units; see seminar requirement), BPSC243, BPSC 244, BPSC 245, BPSC 246, and BPSC 247.

Section IV — Research courses: BPSC 290 and BPSC 297

Section V — Thesis research: BPSC 299, Thesis for Plan I

Normative Time to Degree 7 quarters

Doctoral Degree

The Department of Botany and Plant Sciences offers programs leading to the Ph.D. degree in Plant Biology.

The student must meet the general requirements of the Graduate Division.

Admission
Either prior to entering the graduate program or before advancement to candidacy, students must have completed the equivalent of BPSC 104 and one other course from the core plant biology courses (BIOL 107A, BPSC 132, BPSC 135, BPSC 138, BPSC 143, BPSC 146). Course requirements for each student are determined by individual guidance committees and by the educational advisory committee. No later than the second quarter in residence, students meet with a guidance committee to (1) determine a course program to be submitted to the educational advisory committee,and (2) choose a major area of specialization and two minor areas.

Course Work
Guidance committees and students should design individual course programs that meet the specific needs of the student and the requirements of the Ph.D. program. Course programs should prepare students for the qualifying examination and dissertation research. All first-year students must enroll in BPSC 200A and 200B during their first Fall and Spring quarters. Students must take a minimum of 3 graduate-level courses (11-12 units) relevant to the specialization. Graduate courses taken previously may be considered towards fulfilling this requirement. Students' course programs must be approved by the educational advisory committee. At the time of submission of course programs to the educational advisory committee, the area of specialization and two minor areas to be covered on the qualifying examination should be specified. Students may petition to change the course program, area of specialization, or minor areas at any time.

Students entering the Plant Biology Ph.D. program have four choices, as listed below. Students with a general interest in plant biology and/or evolution are encouraged to choose the first.

Ph.D. in Plant Biology
Students who choose to obtain a Ph.D. in Plant Biology without one of the following concentrations are encouraged to – with the advice and consent of their Major Professor and Guidance Committee – select a set of graduate-level courses (11-12 U) that is specifically tailored to their individual research interests and career objectives.

Students can also choose from one of three concentrations:

Ph.D. in Plant Biology
(Concentration in Plant Cell, Molecular, and Developmental Biology)
To earn the concentration in Plant Cell, Molecular, and Developmental Biology (appears on the transcript only), students must complete BPSC 231, and BPSC 235. In addition, the required BPSC 240 course must be on a topic related to the concentration.

Ph.D. in Plant Biology
(Concentration in Plant Ecology)
To earn the concentration in Plant Ecology (appears on the transcript only), students must complete BPSC 245, and two additional courses (7-8 units) from the following list: EEOB 211, EEOB 212, EEOB 217, EEOB 230, BPSC 225J, BPSC 243, BPSC 244, BPSC 246, BPSC 247, ENTM 241, ENSC 218, ENSC 232, GEO 260, and GEO 268. In addition, the required BPSC 240 course must be on a topic related to the concentration.

Ph.D. in Plant Biology
(Concentration in Plant Genetics)
To earn the concentration in Plant Genetics (appears on the transcript only), students must complete three graduate-level courses (11-12 units) relating to Genetics. Required courses must include two courses from the following list: BPSC 221, BPSC 222, BPSC 225K, BPSC 231, BPSC 234, EEOB 214, BIOL 221/MCBL 221/PLPA 226, GEN 240A. The additional units can be chosen in an area that supports the concentration. In addition, the required BPSC 240 course must be on a topic related to the concentration.

Written and Oral Qualifying Examinations
Advancement to candidacy depends on the student passing written and oral qualifying examinations. The qualifying examination covers the student's area of specialization and two minor areas. Granting of the degree is contingent upon acceptance of the dissertation by the candidate's dissertation committee and satisfactory oral defense of the dissertation.

Oral Qualifying Exam and Final Defense Modality
In-person oral qualifying exams and dissertation defense are strongly recommended, and every effort should be made to hold these discussions in person. However, if unusual circumstances exist that prohibit a fully in-person meeting, a hybrid or fully online option should be made available, in agreement with the committee chair and student, and approval by the graduate advisor (who may find it necessary to consult with the Graduate Educational Advisory Committee). If the oral qualifying exam and/or dissertation defense has been scheduled for in-person, but a committee member has emergency circumstances, then remote accommodation should be made available for that faculty member. The priority should be to hold the exam and/or defense on the originally scheduled day, unless extenuating circumstances prevent this.

Committee members nominated from outside the UC Academic Senate who participate remotely must have qualifications comparable to a UC Academic Senate member and submit a letter of intention and CV. In addition, strong academic justification for inclusion on the committee must be provided by the Graduate Advisor.

Seminar Requirement
All candidates must enroll in the BPSC 250 seminar during each quarter in which it is offered until advancement to candidacy. After this time, PhD candidates must enroll in BPSC 250 seminar two quarters per year until conferral of the degree. The dissertation defense is normally presented in the BPSC 250 seminar series; however, if necessary, a special seminar may be scheduled for the defense. Also, students must present at least one BPSC 250 seminar in addition to the defense of the

dissertation. All students must complete at least one quarter of BPSC 240 (or approved equivalent that involves substantial student presentations) during the Ph.D. program.

Professional Development Training
Ph.D. graduate students must enroll in BPSC 200A and BPSC 200B to fulfill their professional development training requirement. Students may enroll in BPSC 200C to develop skills in research mentoring in the life sciences.

Foreign Language Requirement None

Teaching Requirement
Students must obtain at least two quarters of teaching experience.

Normative Time to Degree 15 quarters

Normative Time to Candidacy 2 years

Lower-Division Courses

BPSC 011 Plants and Human Affairs 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction for non-science and non-Botany majors to the importance of plants and plant products in the shaping of human affairs and civilization. Covers the origin and practice of agriculture; the utilization of plant products; the latest agricultural advances, including genetic engineering; and the current agricultural and social issues. Plants and plant products are examined during class demonstrations and exercises.

BPSC 021 California's Cornucopia: Food From the Field to Your Table 5 Lecture, 3 hours; discussion, 1 hour; outside activities, 30 hours per quarter. Prerequisite(s): none Examines California's diverse agricultural products. Addresses related contemporary issues such as crop improvement by biotechnology, climate change, pollution, resource use, and nutrition. Also examines how the interplay of geography, history, and culture shapes the cuisine of a region.

BPSC 031 Spring Wildflowers 4 Lecture, 3 hours; laboratory, 3 hours; one Saturday field trip. Prerequisite(s): none General approach to the study of vegetative and floral features of plants as a means of identification and botanical classification of major plant families in Southern California. Secondary emphasis on the field biology of flowering plants.

BPSC 050 The Evidence For Evolution 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Introduces and explores the extensive evidence supporting evolution as the driver of biological diversity. Designed for non-science majors and/or those with limited prior knowledge about biology. Includes the scientific method, paleontology, natural selection, genetics, speciation, and the importance of sex. Addresses the broader need for scientific literacy in society. Cross-listed with ENTM 050.

BPSC 060W Scicomm: Exploring Effective Communication Methods in the Life Sciences 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): WRIT 040P, may be taken concurrently; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; BIOL 005A with a grade of C- or better. Teaches the process of analyzing and translating scientific research into popular science stories. Introduces the art of science communication through written narratives. Provides resources and guidance on interpretation of scientific literature; interviewing scientists; and pursuing careers in entomology, the broader life sciences, and science writing. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to WRIT 030. Cross-listed with ENTM 060W.

BPSC 097 Lower-Division Research 1 to 4 Individual Study, 3 to 12 hours. Prerequisite(s): consent of instructor. Involves special research projects in plant biology performed under faculty supervision. Requires a final written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

Upper-Division Courses

BPSC 104 Foundations of Plant Biology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C. A study of the plant world from cells to ecosystems. Examines the structure and function of organisms from the major plant groups and their role in the biosphere. The laboratory explores the unique properties of plants. Cross-listed with BIOL 104.

BPSC 109 Epigenetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102. Introduction to mechanisms that cause a heritable change in phenotype without a change in the genetic code. Covers DNA modifications, histone modifications, and noncoding RNAs that influence the expression, maintenance, and inheritance of traits. Discusses impacts of epigenetics on multicellular life such as learning, memory, disease, and crosstalk with environments. Cross-listed with CBNS 109.

BPSC 112 Systematics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C or equivalent. Principles and philosophy of classification. Topics include phylogenetic and phenetic methods, species concepts, taxonomic characters, evolution, hierarchy of categories, and nomenclature. Cross-listed with BIOL 112, and ENTM 112.

BPSC 132 Plant Anatomy 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A and BIOL 005B; BPSC 104 or BIOL 104; or consent of instructor. Functional and developmental aspects of plant cell, tissue, and organ structure. Covers all aspects of the flowering plant life cycle from germination to pollination and fruit and seed development. Cross-listed with BIOL 132.

BPSC 133 Plant Diversity and Evolution 5 Lecture, 3 hours; laboratory, 3 hours; field, 30 hours per quarter. Prerequisite(s): BIOL 005C; or consent of instructor. Introduces the principles and methods of identifying, naming, and classifying flowering plants. Surveys selected flowering plant families in California and shows their interrelationships. Introduces the principles and methods of identifying, naming, and classifying flowering plants. Surveys selected flowering plant families in California and shows their interrelationships.

BPSC 134 Soil Conditions and Plant Growth 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 104/BPSC 104 or ENSC 100; or consent of instructor. A study of the chemical, physical, and biological properties of soils and their influence on plant growth and development. Topics include soil-plant water relations; fundamentals of plant mineral nutrition; soil nutrient pools and cycles; soil acidity, alkalinity, salinity, and sodicity; root symbioses; and rhizosphere processes. Cross-listed with ENSC 134.

BPSC 135 Plant Cell Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; BCH 100 or BCH 110A; or consent of instructor. Explores concepts of dynamic plant cell structures and functions as revealed by modern technologies such as genetic manipulation and live-imaging of cellular structures and molecules.

BPSC 138 Plant Developmental Morphology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC; BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; or consent of instructor. Introduces the key areas of research in plant morphology and developmental biology. Emphasizes flowering plants (angiosperms). Cross-listed with BIOL 138.

BPSC 143 Plant Physiology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C, MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC; BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; BPSC 104 or BIOL 104; or consent of instructor. A survey of the fundamental principles of plant physiology including photosynthesis, respiration, water relations, mineral nutrition, growth, morphogenesis, plant hormones, dormancy, and senescence. Cross-listed with BIOL 143.

BPSC 145 Geospatial Analytics For Landscape Ecology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): PBPL 010; or equivalent; or consent of instructor. Builds on the basic understanding of fundamental concepts of Geographic Information Science (GIScience). Applies spatial data concepts to understand the ecological impacts of human activities across landscapes. Examines the link between landscape patterns and ecological processes at larger spatial scales.

BPSC 146 Plant Ecology 4 Lecture, 3 hours; laboratory, 1.8 hours; field, 1.2 hours. Prerequisite(s): BIOL 104 or BPSC 104 or BIOL 116; STAT 010; or consent of instructor. A study of the fundamentals of plant ecology. Emphasizes community ecology, environment, life histories, population dynamics, species interactions, succession, ecosystem and landscape ecology, and plant conservation

ecology. Cross-listed with BIOL 146.

BPSC 148 Quantitative Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC; STAT 011; BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; BIOL 102. Examines approaches to studying the genetic basis of polygenic metric traits. Includes types of gene action, partitioning of variance, response to selection, and inferring the number and location of quantitative trait loci. Cross-listed with BIOL 148.

BPSC 149 Nanobiotechnology 2 Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): BIOL 005C; BIOL 102; CHEM 008C or CHEM 08HC, CHEM 08LC or CHEM 08HLC; PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC or PHYS 040C or PHYS 040HC; restricted to class level standing of junior, or senior; or consent of instructor. An Introduction to fundamental concepts of the emergent field of nanobiotechnology and its application to plant and medical sciences. Topics include nanomaterial-mediated genome editing and transformation, targeted and controlled drug delivery, nanosensors for electrical signals and signaling molecules, and cyborg plants and animals with augmented or novel functions.

BPSC 150 Genes, Selection, and Populations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102 with a grade of "C-" or better, upper-division standing; or consent of instructor. Considers the conscious manipulation of allelic frequencies in populations as the basis for domestication of crop and animal species. Examines the genetic basis and standard strategies for the improvement of targeted characteristics in populations of plants and animals through selection and introgression of specific genes and gene constructs.

BPSC 155 Chromosomes 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C, MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC; BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; or consent of instructor. An examination of the structure, function, and behavior of eukaryotic chromosomes. Cross-listed with BIOL 155.

BPSC 165 Restoration Ecology 4 Lecture, 3 hours; field, 8 hours. Prerequisite(s): BIOL 104 or BPSC 104 or BIOL 116 or ENSC 100; CHEM 008B, CHEM 08LB or CHEM 08HB, CHEM 08HLB; STAT 010, may be taken concurrently; or consent of instructor. An examination of the basic ecological principles related to land restoration. Topics include enhanced succession; plant establishment; plant adaptations; ecotype; weed colonization and competition; nutrient cycling; functions and reintroduction of soil microorganisms; restoration for wildlife; and the determination of successful restoration. Includes field trips to restored sites. Cross-listed with BIOL 165.

BPSC 166 Plant Physiological Ecology 4 Lecture, 3 hours; workshop, 1 hour. Prerequisite(s): BIOL 005C or consent of instructor; university-level courses in mathematics, physics, and chemistry are recommended. Topics include plant responses to light, temperature, evaporative demand, and limiting soil conditions. Explores photosynthesis, plant-water relations, and plant-temperature relations. Gives attention to plant adaptation to climates with varying aridity and temperature extremes.

BPSC 167 Forest Ecology 3 Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): BIOL 116. An introduction to the ecology of forest ecosystems. Explores modern research and management in the field. Topics include major forest types within California, tree physiology, forest soils, forest population and community dynamics, wildfire, and forest management. Includes combination of indoor laboratory, field labs, and field trip to local forest. Cross-listed with BIOL 167.

BPSC 183 Plant Biochemistry and Pharmacology of Plant Metabolites 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110A or BCH 110HA, BCH 110B or BCH 110HB; or BCH 100; or consent of instructor. Explores plant biochemistry and the significance of plant metabolites in medicine and pharmacology. Focuses on biotechnology, medicinal plants, and plant-derived drugs as well as the biochemical and pharmacological mode-of-action of secondary plant metabolites. Also addresses plant-specific biochemical processes such as photosynthesis. Cross-listed with BCH 183.

BPSC 184 Planning For A Postgraduate Career in Life Sciences 2 Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; restricted to major(s) Biochemistry, Biology, Cell, Molecular, and Developme, Entomology, Microbiology, Neuroscience, Plant Biology; or consent of instructor. Introduces life science majors to diverse career options in industry, government, and academia. Develops skills for finding and acquiring jobs. Emphasizes careers in the agricultural sciences, biotechnology, and related areas through presentations by professionals representing a variety of educational levels and careers. Cross-listed with ENTM 184.

BPSC 190 Special Studies 1 to 5 variable hours. Library, laboratory or field work designed to meet special curricular needs. A written proposal signed by the supervising faculty member must be approved by the major advisor and the Department Vice Chair. A written report must be filed. Course is repeatable, but total credit toward graduation may not exceed 6 units.

BPSC 191 Seminar in Agricultural Careers in the 21st Century 1 Seminar, 1 hour. Prerequisite(s): sophomore or junior standing; or consent of instructor. Introduces students to diverse career options in agriculture and biotechnology through seminars and interviews with industry, government, and academic professionals. Develops skillsets for finding and acquiring jobs in agricultural and biotechnology. Graded Satisfactory (S) or No Credit (NC)

BPSC 193 Senior Seminar 2 Seminar, 1 hour; lecture, 1 hour. Prerequisite(s): BPSC 104 or BIOL 104; 2 of the following: BIOL 143, BPSC 143, BPSC 133, BPSC 132, BIOL 132; restricted to class level standing of senior; restricted to major(s) Plant Biology; or consent of instructor. Emphasizes thinking across hierarchical levels and understanding structure-function relationships in plant biology. Includes lectures and presentation of classical or landmark papers. Satisfactory(S) or No Credit(N/C) is not available.

BPSC 195H Senior Honors Thesis 1 to 4 Thesis, 3 to 12 hours. Prerequisite(s): upper division standing; admission to University Honors or consent of instructor. Directed research and completion of a senior Honors thesis under the supervision of a faculty member. Course is repeatable to a maximum of 12 units.

BPSC 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): upper-division standing; consent of instructor. Individual research conducted under the direction of a Botany and Plant Sciences faculty member. A written proposal must be approved by the supervising faculty member and undergraduate advisor. A written report must be filed with the supervising faculty member at the end of the quarter. Course is repeatable.

BPSC 198I Individual Internship in Botany and Plant Sciences 1 to 12 Internship, 2 to 24 hours; written work, 1 to 12 hours. Prerequisite(s): upper-division standing; consent of instructor. An off-campus internship related to plant biology. The student conducts the internship in the public or private sector but is jointly supervised by an off-campus sponsor and a faculty member in Botany and Plant Sciences. Requires an initial written proposal and a final written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

BPSC 199 Senior Research 2 to 4 Laboratory, 6 to 12 hours. Prerequisite(s): senior status; a GPA of 3.2 or better in upper-division courses in Botany/Plant Science and Biology; or consent of instructor. Individual research on a problem relating to Botany/Plant Science. A written proposal signed by the supervising faculty member must be approved by the major advisor and the Department Vice Chair. A written report must be filed with the supervising faculty member. Course is repeatable, but total credit toward graduation may not exceed 9 units.

Graduate Courses

BPSC 200A Plant Biology Core 2 Lecture, 1 hour; practicum, 3 hours. Prerequisite(s): graduate standing in Plant Biology or consent of instructor. Explores plant biology research approaches. Emphasizes critical thinking and advanced planning of hypothesis testing, as well as experimental/descriptive/theoretical caveats, trade-offs, and options. Presents topics in a case-study approach. Also addresses professional development.

BPSC 200B Plant Biology Core 2 Lecture, 1 hour; practicum, 3 hours. Prerequisite(s): BPSC 200A; graduation standing. Builds on material covered in BPSC 200A. Focuses on creating complete grant proposals based upon the guidelines of an actual funding source. Presents topics in a case-study approach. Includes peer review of completed proposals.

BPSC 200C Plant Biology Core 2 Lecture, 0.5 hour; discussion, 0.5 hour; written work, 3 hours. Prerequisite(s): restricted to major(s) Plant Biology; graduate standing; or consent of instructor. Teaches how to become a reflective and effective research mentor. Includes designing and implementing an effective strategy to mentoring. Addresses learning how to critically evaluate student learning and the effectiveness of mentoring initiatives. Creates a mentoring community where challenges and solutions can be shared among students with diverse backgrounds. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BPSC 201 (E-Z) Plant Molecular Biology 1 to 2 Laboratory, 3 hours. Prerequisite(s): graduate standing. Explores the theory and principles of instruments and laboratory techniques applicable to research in the plant sciences. Experiments provide experience in the use of laboratory instruments and techniques including applications and limitations. E. Plant Molecular Biology; F. Plant Ecology; G. Plant Systematics; I. Plant Microscopy; J. Plant Physiology; K. Plant Genetics; M. Plant Cell Biology; N. Plant Cytogenetics. Course is repeatable to a maximum of units.

BPSC 208 Product Design and Entrepreneurship For Agricultural and Biological Applications 3 Lecture, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Examines the discovery, design, and evaluation processes for biological and agricultural products through team study and project design. Includes participation from various disciplines working together to broaden knowledge and enhance communication skills key to tackling challenges related to agriculture, the environment, human health, and other needs. May be Taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D. Cross-listed with CEE 208.

BPSC 212 Metabolomics: Exploring Plant Metabolism and Human Health 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): restricted to major(s) Biochemistry, Plant Biology; graduate standing; or consent of instructor. Introduction to metabolomics focusing on metabolomics and its applications in plant sciences, medicinal chemistry, and personalized medicine. Explores key techniques like mass spectrometry and nuclear magnetic resonance along with data analysis and bioinformatics. Highlights the role of plant metabolites in agriculture and medicine and explores how metabolomics supports personalized healthcare.

BPSC 221 Advanced Plant Breeding 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 148/BPSC 148 or consent of instructor; BPSC 150. Advanced treatment of plant breeding theory and practice including development and use of information on inheritance of traits; choice of breeding plans; breeding for yield, quality, and disease and stress resistance; and use of biotechnology.

BPSC 222 Origins of Agriculture and Crop Evolution 3 Lecture, 3 hours. Prerequisite(s): BIOL 102, BIOL 104/BPSC 104; or consent of instructor. Analysis of origins of agriculture in the Near East, China, the New World, and Africa. Survey of domestication and evolution of major crop plants and animals.

BPSC 225 (E-Z) Advanced Topics in Plant Biology 2 Lecture, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. An in-depth examination of selected topics in plant biology. E. Agricultural Plant Biology; F. Plant Cell Biology; G. Plant Development; I. Plant Evolution And Systematics; J. Plant Ecology; K. Plant Genetics; M. Plant Molecular Biology; N. Plant Biochemistry And Physiology; P. Nanobiotechnology. Course is repeatable as content or topic changes.

BPSC 230 Molecular Plant-Microbial Interactions 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 120 or MCBL 120 or PLPA 120, or equivalents; graduate standing. A study of the physiology of host-pathogen interactions with emphasis on the metabolism of diseased plants, nature of pathogenicity, and defense mechanisms in plants. Cross-listed with PLPA 230, CMDB 230, and GEN 230.

BPSC 231 The Plant Genome 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 107A; or BCH 110A or BCH 110HA, BCH 110B or BCH 110HB, BCH 110C or BCH 110HC; or consent of instructor. Gives students an appreciation for the structure of the plant nuclear, chloroplast, and mitochondrial genomes. Gene structure, regulation of gene expression, transposons, and methods of gene introduction are also emphasized. Cross-listed with BCH 231.

BPSC 232 Plant Development 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BCH 110HC or BIOL 107A; BIOL 102; BIOL 104/BPSC 104; or consent of instructor. An examination of plant development, with emphasis on the genetic mechanisms used in patterning plant forms. Topics are taken from current literature and focus on molecular and cellular mechanisms.

BPSC 234 Statistical Genomics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102, STAT 231B; or consent of instructor. Examines statistical methods of genome analysis. Topics include screening for genetic markers, linkage analysis, linkage disequilibrium, and mapping genes for complex diseases and quantitative traits. Covers statistical techniques including analysis of least squares and maximum likelihood, Bayesian analysis, and Markov chain Monte Carlo algorithm. Cross-listed with GEN 234.

BPSC 235 Plant Cell and Developmental Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100 or BCH 100H or BCH 110B or BCH 110HB; BCH 110C or BCH 110HC or BCH 107A; BIOL 102; BIOL 104 or BPSC 104; BIOL 143 or BPSC 143 or CBNS 101; or their equivalents; graduate standing; or consent of instructor. Studies the structure, function, and dynamics of plant cell division, expansion, and specialization as well as molecular and genetic mechanisms in patterning plant forms during development. Emphasizes the aspects unique to plants including cytoskeletal and cell plate dynamics; intracellular trafficking and wall-dynamics; and targeting to chloroplasts and vacuoles.

BPSC 237 Plant Cell Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 107A or BIOL 143/BPSC 143 or BCH 100 or CBNS 101 or their equivalents, or consent of instructor. Studies the structure, function, and dynamics of plant cell division, expansion, and specialization. Emphasis on aspects unique to plants including cytoskeletal and cell plate dynamics during cytokinesis; intracellular trafficking and wall-dynamics during expansion; and targeting to chloroplasts and vacuoles during specialization.

BPSC 239 Advanced Plant Physiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 143/BPSC 143 or consent of instructor. Examines advances in plant physiology, with emphasis on carbon and nitrogen metabolism, mineral nutrition, solute transport and phloem translocation, plant growth regulators, and secondary compounds in relation to growth and development.

BPSC 240 Special Topics in Plant Biology 2 Seminar, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Discussion of current literature within special areas of plant science. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content or topic changes.

BPSC 243 Plant Physiological Ecology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 143/BPSC 143; BPSC 146 or equivalent; or consent of instructor. Analyzes adaptations and responses of plants to their environment, with emphasis on the physical environment, photosynthesis, temperature and water relations, growth and allocation, and plant interactions.

BPSC 244 Species Distribution Modeling 4 Lecture, 2 hours; discussion, 1 hour; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Overview of species distribution modeling,

also called environmental niche modeling or habitat suitability modeling. Addresses biogeographical theories of species niche, data models for species and environmental data, and data analysis and model validation. Applies modern regression (Generalized Linear Models) and other modeling techniques (GAMs, classification trees, MaxEnt) using R software. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BPSC 245 Advanced Plant Ecology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C or MATH 09HC; STAT 110 or STAT 231A or equivalent; an undergraduate course in ecology; or consent of instructor. Explores the fundamental ecological concepts, theoretical developments, quantitative methods, and experimental results involved in multiscale plant ecological studies. Emphasizes plant strategies, vegetation processes, ecosystem properties, and terrestrial landscapes and their interaction with environmental change and human land use.

BPSC 246 Landscape Ecology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 116 or BPSC 146; STAT 231A; or consent of instructor. Introduces landscape ecology both as a sub-discipline of ecology and an interdisciplinary approach for environmental research. Includes identification of spatial patterns, pattern-process relationships, and scaling. Analyzes population, community, and ecosystem dynamics in connection with landscape functioning. Evaluates landscape theory and methods for applications in species conservation, pollution, and climate changes.

BPSC 247 Ecological Theory and Modeling 4 Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): MATH 009C or MATH 09HC; STAT 110 or STAT 231B or equivalent; an undergraduate course in ecology; or consent of instructor. Explores the fundamental ecological theory and modeling methodology with emphasis on the ecosystem and landscape levels. Synthesizes current research developments in the context of their classic works.

BPSC 250 Seminar in Plant Biology 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Intensive study of selected topics in plant biology. Includes lectures by students, faculty, and invited scholars on subjects related to the principles of plant biology. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

BPSC 252 Special Topics in Botany/Plant Science 1 Seminar, 1 hour. Prerequisite(s): graduate standing and consent of instructor. Oral presentations and intensive small-group discussion of selected topics in the area of special competence of each staff member. Course content will emphasize recent advances in the special topic area and will vary accordingly. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BPSC 261 Seminar in Genetics, Genomics, and Bioinformatics 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BIOL 261, ENTM 261, PLPA 261, and GEN 261.

BPSC 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing; and consent of instructor. Library, laboratory, or field studies conducted under the direction of a faculty member. Designed to meet specific curricular needs in areas of plant biology not covered by formal course work and outside of required directed dissertation or thesis research. Not intended to replace BPSC 297 or BPSC 299.

BPSC 291 Individual Study in Coordinated Areas 1 to 6 Prerequisite(s): graduate standing. A program of study designed to advise and assist candidates who are preparing for examinations. Up to 6 units may be taken prior to the master's degree. Up to 12 units may be taken prior to advancement to candidacy for the Ph.D. Graded Satisfactory (S) or No Credit (NC). Course is repeatable upon recommendation of the instructor.

BPSC 292 Concurrent and Advanced Studies in Botany and Plant Sciences 1 to 4 Research, 3 to 12 hours. Prerequisite(s): graduate standing; and consent of instructor. Elected concurrently with an appropriate undergraduate course, but on an individual basis. Devoted to one or more graduate projects based on research and criticism related to the course. Faculty guidance and evaluation is provided throughout the quarter.

BPSC 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing or consent of instructor. Individual research conducted under the direction of a Botany and Plant Sciences faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BPSC 299 Research For Thesis Or Dissertation 1 to 12 Thesis, 3 to 36 hours. Prerequisite(s): graduate standing. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Genetics and Biotechnology

Lower-Division Courses

GNBT 010 Genetics and Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A is recommended. Explores how genetic discoveries and technology shape human society in healthcare, reproduction, food, and the environment. Presents science concepts at a level accessible to non-majors. Emphasizes bioethical analyses and considers the cost-benefit tradeoffs of genetic advances.

Upper-Division Courses

GNBT 100 Introduction to Biotechnology: From Cloning to Synthetic Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102 with a grade of C- or better; or equivalent; or consent of instructor. Introduces fundamental techniques used in biotechnology and the molecular biological foundations of biotechnology. Topics include gene cloning, the science of genetically modified organisms (GMOs), microbial and synthetic biology, the design of new purpose-driven organisms and microbial cell factories, biosensing, gene editing, and other contemporary topics in biotechnology.

GNBT 110 Advanced Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102 with a grade of C- or better; or consent of instructor. Teaches the process of associating genes with biological function. Topics include genetics screens, gene characterization, and discovery of genetic pathways. Examines the rationale and design of experiments to investigate hypothesis-driven questions using genetic approaches.

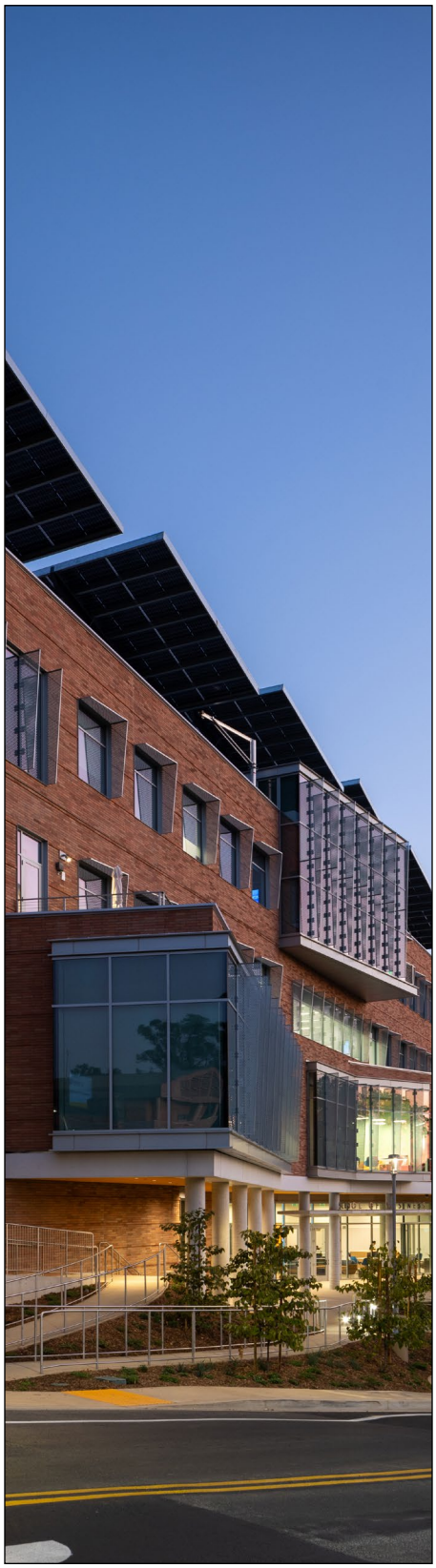
GNBT 114 Molecular Genetics Laboratory 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BIOL 102 with a grade of C- or better, BIOL 107A, may be taken concurrently. Reinforces important concepts in classical and molecular genetics through laboratory work in basic molecular biology and genetics. Includes DNA manipulation techniques and cloning, gene mapping, and isolation and characterization of mutants in eukaryotic model systems.

GNBT 120 Analysis of Genomes Laboratory 4 Lecture, 1 hour; discussion, 1 hour; laboratory, 6 hours. Prerequisite(s): BIOL 005C with a grade of C- or better, BIOL 102 with a grade of C- or better; MATH 007B or MATH 009B or MATH 09HB with a grade of C- or better. Introduces computational approaches used in analysis of genomes and their functional outputs. Topics include genome assembly and annotation, identification and analysis of genomic sequence variation, modern molecular mutant identification, quantitative trait mapping, genome-wide association mapping, mRNA and small RNA profiling, network analysis, and comparative genomics. Computer programming experience not required.

GNBT 130 Genomes: Structure and Evolution 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102 with a grade of C- or better. Explores the content of genomes from microbes to plants to animals emphasizing how they are analyzed and how they diversify and evolve.

GNBT 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): restricted to class level standing of junior, or senior; and consent of instructor. Individual research conducted under the direction of a Genetics and Biotechnology-affiliated faculty member. A written proposal must be approved by the supervising faculty member and undergraduate advisor. Course is repeatable.

GNBT 199 Senior Research 2 to 4 Research, 6 to 12 hours. Prerequisite(s): restricted to class level standing of senior; and consent of instructor. Individual research on a problem relating to GNBT program goals. A written proposal signed by the supervising faculty member must be approved by the GNBT undergraduate advisor. Course is repeatable to a maximum of 9 units.



Business Administration

Subject abbreviation: BUS
The School of Business

Yunzeng Wang, Ph.D., Dean
900 University Ave.
(951) 827-2932

Undergraduate Business Programs Office
900 University Ave.
(951) 827-4551; fax: (951) 827-5061
business.ucr.edu

Professors

Subramanian 'Bala' Balachander, Ph.D. *Albert O. Steffey Chair* (Marketing)
Margaret Campbell, Ph.D. *Associate Dean and Department Chair, and A. Gary Anderson Family Foundation Endowed Presidential Chair* (Marketing)
Y. Peter Chung, Ph.D. (Finance)
Elodie Goodman, Ph.D. (Operation and Supply Chain Management)
Mohsen El-Hafsi, Ph.D. (Operations and Supply Chain Management)
Jerayr 'John' Haleblian, Ph.D. *Associate Dean, and A. Gary Anderson Family Foundation Endowed Presidential Chair in Business Administration* (Management)
Jean Helwege, Ph.D. *A. Gary Anderson Family Foundation Endowed Presidential Chair in Finance* (Finance)
Thomas Kramer,Ph.D. *Associate Dean for the Academic Undergraduate Programs* (Marketing)
Birendra Mishra, Ph.D. (Accounting)
Theodore Mock, Ph.D. *Distinguished Professor* (Accounting)
Ashutosh Prasad, Ph.D. (Marketing)
Yunzeng Wang, Ph.D. *Dean's Distinguished Scholar* (Operations and Supply Chain Management)
Ivy Zhang, Ph.D. (Accounting and Information System)
Rami Zwick, Ph.D. *Associate Dean for the Academic Graduate Programs* (Marketing)

Professors Emeriti

Bajis M. Dodin, Ph.D. (Operations and Supply Chain Management)
Woody Liao, Ph.D. (Accounting)
Kathleen Montgomery, Ph.D. *Distinguished Professor* (Management)
Michael Moore, Ph.D. (Accounting)
Amnon Rapoport, Ph.D. *Distinguished Professor* (Management)
Waymond Rodgers, Ph.D. (Accounting and Information Systems)
Richard Smith, Ph.D. (Finance)
David Stewart, Ph.D. *Distinguished Professor* (Marketing)

Associate Professors

Alexander Barinov, Ph.D. (Finance)
Hai Che, Ph.D. (Marketing)
Long Gao, Ph.D. (Operations and Supply Chain Management)
Michael Haselhuhn, Ph.D. (Management)
Hyun 'Shana' Hong, Ph.D. (Accounting)
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Marlo Raveendran, Ph.D. (Management)
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Danko Turcic, Ph.D. (Operations and Supply Chain Management)
Mindy Truong, Ph.D. (Management)
Elaine Wong, Ph.D. (Management)

Assistant Professors

Eric Allen, Ph.D. (Accounting)
Richard Carrizosa, Ph.D. (Accounting)
Mengmeng Dong, Ph.D. (Finance)
Mingyu 'Max' Joo, Ph.D. (Marketing)
Demetrius Lewis, Ph.D. (Management)
Adem Orsdemir, Ph.D. (Operations and Supply Chain Management)

Assistant Professor of Teaching

Neman Desai, Ph.D. (Accounting)
Kyle Ingram, Ph.D. (Management)
Jonathan Lim, Ph.D. (Marketing)
Sanjoy Moulik, Ph.D. (Information Systems)
Greg Richey, Ph.D. (Finance)
Rich Yueh, Ph.D. (Information Systems)

Lecturers

Arturo Alcaraz (Management)
Sean Jasso, Ph.D. (Management and Marketing)
Jonathan Pittard, M.B.A. (Accounting)
Raj Singh, Ph.D. (Management)

Majors

The B.S. in Business Administration is a two-year upper-division major offered by the School of Business. Students can enroll in a Pre-Business status and are advised in CHASS during their freshman and sophomore years. The Pre-Business curriculum includes the prerequisites to the major and the college breadth requirements. After admission to the major, students are advised by the School of Business through its Undergraduate Business Programs Office located at 0241 School of Business Building. The B.S. degree in Business Administration is conferred by the School of Business.

The program is accredited by the AACSB International - The Association to Advance Collegiate Schools of Business.

Admission

A limited number of students are accepted into the Business Administration major, chosen according to overall GPA. Students must apply for the major when they have completed not fewer than 75 and not more than 100 quarter units of college work. Final acceptance into the major is based on completion of all prerequisites and breadth requirements within a 100-quarter-unit limit, a GPA of 2.50 or above in major prerequisites, and cumulative GPA of at least 2.70. (Students who have not completed the foreign language breadth requirement, ENGL 001C, or one Social Science course of their breadth requirement, may be accepted into the program, but they must complete the requirement before graduation.) Exceptions to the 100-quarter-unit maximum must be requested by petition.

UCR Students (excluding Pre-Business students) interested in changing major to Business Administration will be admissible to the Business Preparatory (BSPR), (which is not a major in UCR, but a holding group of transfer students who appear to be qualified for admission into business administration, but have some deficiencies which need to be completed before admission into business administra-

tion) status only if they can complete their deficiencies in breadth and/or major prerequisites within one quarter (the first quarter after admission into Bus-Preparatory).

The same rule will apply to students transferring in from a community college or a four-year school. In the event these students fail to meet this one quarter requirement, they will not be admitted into the BSPR category, and will be advised to find another major at UCR.

Students are encouraged to participate in at least one internship during their junior or senior year. Students interested in international business are encouraged to participate in Education Abroad, which has programs affiliated with more than 150 institutions in 35 countries worldwide. For details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

Outstanding academic achievement is recognized by the awarding of the Delta Sigma Pi Scholarship Key to a graduating senior. Other awards, presented on an annual basis, include The Gordon Blunden/Provident Savings Bank Business Scholarship.

Graduating seniors are also eligible for the School of Business Award for Academic and Service Excellence, and also the School of Business Concentration Area Awards, which recognizes the student with the best overall performance in each concentration area.

Each Spring, the top 10% of juniors and seniors in the Business Administration program are invited to join Beta Gamma Sigma, the only international honors society recognized by AACSB International. Membership in Beta Gamma Sigma is the highest recognition a business student anywhere in the world can receive in a business program accredited by AACSB International. New Members are recognized by an official induction ceremony led by the Dean of the School of Business in the Spring quarter.

University Requirements

See Undergraduate Studies section.

College Requirements

Students must fulfill all breadth requirements of the College of Humanities, Arts, and Social Sciences or the Intersegmental General Education Transfer Curriculum prior to transferring to the UC.

Major Requirements

The following are requirements leading to the B.S. degree in Business Administration. At least 50 percent of business course requirements must be completed at UCR.

Business Administration Major

1. **Preparation for Business Administration major (6 courses [at least 23 units])**

   Major prerequisites (non-BUS courses may be used to satisfy breadth requirements for the School of Business):

   (1) BUS 010
   (2) BUS 020
   (3) ECON 002
   (4) ECON 003
   (5) STAT 008 or STAT 010 or ECON 101
   (6) MATH 022

The major requirements for the B.S. in Business Administration are as follows:

2. **Upper-division major requirements (19 courses [at least 77 units])**

Core courses (at least 11 courses [at least 44 units]):

ECON 102/ECON103, BUS 100W, BUS 101, BUS 102, BUS 103, BUS 104/STAT 104, BUS 105, BUS 106/BUS 133/ECON 134, BUS 107, BUS 108, BUS 109

Concentration (At least 24 units per concentration): Students in the Business Administration major (BSAD) will be required to declare a concentration at least three quarters prior to graduation, provided they be allowed to change their concentration, if justified. The Office of Undergraduate Business Programs will manage the process. Students can declare up to two concentration.

Choose six courses each from up to two of the concentrations listed below. Courses completed to meet core requirements may not be used to meet concentration requirements.

Accounting and Auditing: BUS 154, BUS 160/ECON 160, BUS 161, BUS 162/ECON 162, BUS 165A, BUS 165B, BUS 165C, BUS 166, BUS 167, BUS 168A, BUS 168B, BUS 169A, BUS 169B, BUS 170, BUS 198i

Business Analytics: BUS 124, BUS 125, BUS 130, and at least three of the following: BUS 119, BUS 123, BUS 129, BUS 136, BUS 173, BUS 182

Finance: If BUS 106 was taken as a core course, the requirements are: BUS 132, BUS 134, BUS 136 and at least three of the following: BUAS 101, BUS 131, BUS 135, BUS 137, BUS 138, BUS 139, BUS 140E, BUS 141, BUS 142, BUS 147

Or

If BUS 133 was taken as a core course, the requirements are: BUS 134, BUS 136 and at least four of the following: BUAS 101, BUS 131, BUS 135, BUS 137, BUS 138, BUS 139, BUS 140E, BUS 141, BUS 142, BUS 147

Information Systems: BUS 110, BUS 125, BUS 128, BUS 163, BUS 166, BUS 171, BUS 172, BUS 173, BUS 174, BUS 175, BUS 179, BUS 198i

Management: BUS 120, BUS 121, BUS 143, BUS 144, BUS 145, BUS 146, BUS 147, BUS 148, BUS 149, BUS 150, BUS 154, BUS 155, BUS 156, BUS 157, ANTH 105/BUS 158, BUS 163, BUS 173, BUS 177, BUS 198i

Marketing: BUS 111, BUS 112, BUS 113, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119, BUS 151, BUS 152, BUS 159, BUS 164, BUS 198i

Operations and Supply Chain Management: BUS 123, BUS 124, BUS 125, BUS 126, BUS 127/STAT 127, BUS 128, BUS 129, BUS 130, BUS 173, BUS 182

Students choosing one concentration will take an additional 2 courses (at least 8 units) of Business Administration elective courses from BUS 110-BUS 199H, excluding BUS 190. Courses completed to satisfy the six-course concentration requirement may not be used to meet this requirement. Related courses outside of Business Administration may be approved to satisfy their requirement with the approval of the Associate Dean or Director of Undergraduate Business Programs.

Students choosing two concentrations will not take elective courses but instead will take an additional 6 courses (at least 24 units) in their second concentration.

Minor

Students declaring a minor in Business Administration will petition the Undergraduate Business Programs Office at least three quarters prior to graduation. That office will publicize the deadlines each quarter to all colleges and major departments.

Prerequisites for the minor in Business Administration are as follows:

Three lower-division courses (14 units) (must be completed with no grade lower than "C"): BUS 020, ECON 003, STAT 008 or STAT 010 or ECON 101

Additionally, students need to complete four upper-division courses as follows, depending on the minor of their choice, the general business minor or any of the eight functional business minors (16 units):

General Business:

Four core courses from the following list: BUS 103, BUS 104/STAT 104, BUS 106 or BUS 133 or ECON 134, BUS 107, BUS 108

Accounting:

a) Required: BUS 108, BUS 165A
b) Two additional upper-division Business Administration accounting courses selected from the following: BUS 161, BUS 165B, BUS 165C, BUS 168A, BUS 168B, BUS 169A, BUS 169B, BUS 170

Business Analytics:

a) Required: BUS 104, BUS 124
b) Two additional upper-division business analytics courses selected from the following: BUS 119, BUS 123, BUS 125, BUS 129, BUS 130, BUS 136, BUS 173, BUS 182

Finance:

a) Required: Either BUS 133 or BUS 106, BUS 132
b) Additional upper-division Business Administration finance courses to meet 4-course minor requirement selected from the following: BUAS 101, BUS 131, BUS 134 (highly recommended), BUS 135, BUS 136 (highly recommended), BUS 137, BUS 138, BUS 139, BUS 140E, BUS 141, BUS 142, BUS 147

Information Systems:

a) Required: BUS 101
b) Three additional upper-division Business Administration information systems courses selected from the following: BUS 110, BUS 125, BUS 128, BUS 163, BUS 166, BUS 171, BUS 172, BUS 173, BUS 174, BUS 175, BUS179

Management: Organizational Behavior/Human Resources:

a) Required: BUS 107, BUS 155
b) Two additional upper-division Business Administration organizational behavior or human resources courses selected from the following: BUS 121, BUS 143,

BUS 144, BUS 145, BUS 149, BUS 156, BUS 157, BUS 177

Management: Strategy and Entrepreneurship:

a) Required: BUS 109, BUS 146

b) Two additional upper-division Business Administration courses selected from the following: BUS 120, BUS 121, BUS 143, BUS 144, BUS 145, BUS 147, BUS 148, BUS 149, BUS 150, BUS 154, BUS 155, BUS 156, BUS 157, BUS 159, BUS 163, BUS 173

Marketing:

a) Required: BUS 103

b) Three additional upper-division Business Administration marketing courses selected from the following: BUS 111, BUS 112, BUS 113, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119, BUS 151, BUS 152, BUS 159, BUS 164

Operations and Supply Chain Management:

a) Required: BUS 104, BUS 105

b) Two additional upper-division Business Administration operations and supply chain management courses selected from the following: BUS 123, BUS 124 (highly recommended), BUS 125, BUS 126, BUS 127/STAT 127, BUS 128, BUS 129 (highly recommended), BUS 130, BUS 173, BUS 182

Lower-Division Courses

BUS 001 Personal Finance 4 Lecture, 3 hours; workshop, 1 hour. Prerequisite(s): none. Provides students with tools necessary to analyze the decision to finance their UCR education with student loans. Topics include personal budgets, student loans, interest rates, career planning, auto and health insurance, and other issues related to financing higher education. Credit is awarded for only one of BUS 001 or BUS 001H.

BUS 001H Personal Finance 4 Lecture, 3 hours; workshop, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to BUS 001. Provides students with tools necessary to analyze the decision to finance their UCR education with student loans. Topics include personal budgets, student loans, interest rates, career planning, auto and health insurance, and other issues related to financing higher education. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of BUS 001 or BUS 001H.

BUS 010 Introduction to Business 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Provides an overview of the field of business administration. Explores business goals and strategies; functional areas of business and their integration in policy and decision making; social responsibility; computers in business; and business trends and challenges including the international dimension.

BUS 020 Financial Accounting and Reporting 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A study of the concepts and techniques for measurement and communication of financial information. Includes interpretation of financial statements.

BUS 021 Generation of Financial Accounting Information 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 020 with a grade of "C-" or better. A detailed study of the process of measuring, recording, and communicating financial accounting information. .

BUS 098 Personal Branding and Professional Development 2 Lecture, 2 hours. Prepares for successful internships and develops critical career management skills through greater understanding of abilities and preferences as well as available job search resources. Explores career-enhancing techniques such as self-assessment, career research, resume writing, networking, interviewing, and professionalism. Graded Satisfactory (S) or No Credit (NC).

Upper-Division Courses

BUAS 101 Fundamentals of Insurance 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): BUS 106 or ECON 134 or BUS 133. Introduces the insurance industry and the pricing of actuarial risks. Topics include asymmetric information, adverse selection, and moral hazard as they apply to life insurance and property and casualty policies, state regulations, and models for regulatory capital and reinsurance.

BUS 100W Management Writing and Communication 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in WRIT 040E; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; BUS 020; ECON 003 or ECON 003H; STAT 008; or consent of instructor. Focuses on writing and communication methods in the business environment. Topics include written and oral presentations, interpersonal skills, teamwork in the multicultural setting, and effective use of communication technologies. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to WRIT 030.

BUS 101 Information Technology Management 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 020; ECON 003; STAT 008; or equivalent; or consent of instructor. Topics include computer hardware and software, business data processing, databases, telecommunications, systems analysis and design, cost-benefit analysis, and systems applications in business. Includes database and spreadsheet projects.

BUS 102 Ethics and Law in Business and Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 020; ECON 003; STAT 008; or equivalent; or consent of instructor. Analyzes the legal, ethical, political, and social aspects of the business environment. Topics include ethics and social responsibility, government regulation, corporate governance, and global management issues.

BUS 103 Marketing and Distribution Management 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 020; ECON 003 or ECON 003H, STAT 008; or consent of instructor. An introduction to the role of marketing in society emphasizing concepts, marketing methods, and institutions.

BUS 104 Decision Analysis and Management Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 008 or STAT 010; or equivalents; or consent of instructor. A survey of deterministic and probabilistic models for decision making. Topics include linear programming and extensions, networks, dynamic programming, decision trees, queuing models, and simulation. Explores the application of these models in decision making. Cross-listed with STAT 104.

BUS 105 Production and Operations Management 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 008 or STAT 010; or equivalent. Addresses the issues of design and control of production systems in manufacturing and service organizations. Covers product and process selection, capacity planning, location and layout design, project and job scheduling, inventory control, material planning, and quality control.

BUS 106 Introduction to Financial Management 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 020; ECON 003 or ECON 003H; STAT 008 or ECON 101; or equivalent; or consent of instructor. An introduction to financial management and financial institutions. Includes time value of money, stock and bond valuation, risk and return, portfolio theory, capital budgeting, capital structure, dividend policy, and financial databases. Cross-listed with ECON 134. Credit is awarded for one of the following BUS 106, ECON 134, or BUS 133.

BUS 107 Organizational Behavior 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 020; ECON 003; STAT 008; or equivalent; or consent of instructor. Studies organizations from the behavioral science perspective. Topics include motivation, leadership, communication, groups, organization structure and culture, and control in complex organizations.

BUS 108 Financial Evaluation and Managerial Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 020; ECON 003; STAT 008; or equivalents; or consent of instructor. A study of accounting data used for managerial planning and controlling of business operations. Provides an introduction to manufacturing operations and cost accounting systems, cost-volume-profit analysis, relevant costing, standard costing and variance analysis, and budgeting.

BUS 109 Competitive and Strategic Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 100W; BUS 103; BUS 108; BUS 106 or ECON 134 or BUS 133; restricted to major(s) Business Administration. Provides an understanding of strategic decision-making processes in organizations, the interrelationships among functional areas, and how decision making is affected by internal and external environments.

BUS 110 Introduction to Data Mining and Visual Analytics 4 Lecture, 2 hours; laboratory, 1 hour; extra reading, 2 hours; written work, 3 hours. Prerequisite(s): BUS 101. Covers the processes, methodologies and practices used to transform data into useful information to support business decision-making. Offers an opportunity to gain insights and hands-on-experience with basic functionality of industry standard data mining and visualization software tools such as Tableau, JMP and IBM's Watson Analytic.

BUS 111 Services Marketing 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): BUS 103. Covers the marketing of services and ideas. Focuses on marketing for service organizations such as hotels, hospitals, and banks. Provides understanding of the broader role of service provision for both service firms and goods firms.

BUS 112 Consumer Behavior 4 Lecture, 3 hours; extra reading, 2 hours; activity, 1 hour. Prerequisite(s): BUS 103. Provides a basic understanding of the general models of choice behavior as it relates to marketing decision making. Emphasizes motivation, perceptions, learning, and social forces as they impact the choice process.

BUS 113 Marketing Channels 4 Lecture, 3 hours; written work, 2 hours; extra reading, 1 hour. Prerequisite(s): BUS 103. Covers the concepts and strategies relating to the distribution of products and services through retail and wholesale business channels. Focus on the management of marketing and Salesforce activities within these channels of distribution.

BUS 114 Marketing in A Global Environment 4 Lecture, 3 hours; research, 2 hours; term paper, 1 hour. Prerequisite(s): BUS 103. Covers the theory and practice of marketing across national borders. Provides an understanding of global marketing environments and examines the development of marketing strategies to maximize growth of global companies.

BUS 115 Marketing Research 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): BUS 103. Covers types and sources of marketing information, the marketing research process, and techniques of data collection and analysis, including consumer and customer surveys and test marketing. Examines both quantitative and qualitative research with analysis of the values and limitations of data. Emphasis is placed on evaluation and interpretation of results.

BUS 116 Pricing Strategy and Management 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): BUS 103 or consent of instructor. Integrates theory and practice into a framework for making pricing decisions. Prepares for addressing strategic and tactical pricing issues. Topics include customer demand and price sensitivity, psychological reaction to price, segmented pricing, price promotions, bundling, online pricing, dynamic pricing, competitive reaction, profitability analysis, and pricing strategy development.

BUS 117 Advertising and Integrated Marketing Communications 4 Lecture, 3 hours; extra reading, 2 hours; activity, 1 hour. Prerequisite(s): BUS 103. Covers the basic concepts and functions of advertising, sales promotion, and other communication tools in an integrated marketing communications framework.

BUS 118 Digital Marketing 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): BUS 103. An introduction to the role of digital marketing in business-to-consumer and business-to-business marketing. Covers the application of traditional marketing principles to an electronic commerce environment and new digital marketing techniques made possible by this environment.

BUS 119 Data-Driven Marketing 4 Lecture, 3 hours; individual study, 2 hours; extra reading, 1 hour. Prerequisite(s): BUS 103; or consent of instructor. Examines marketing cases and develops data analytical skills for managerial decision making. Utilizes statistical software to manage, display, and analyze marketing information including consumer survey, relationship management, scanner, and socioeconomic data. Topics include attitude measurement, market segmentation and targeting, competition analysis, market performance analysis, and store location choice.

BUS 120 Global Strategy 4 Lecture, 3 hours; extra reading,1 hour; term paper, 2 hours. Prerequisite(s): BUS 109 or equivalents. Introduces global strategic management and how to win the global marketplace. Covers topics including the challenges of creating the right kind of organization, motivating a global workforce, entering new markets, creating global competitive advantage, and building a global mindset.

BUS 121 Employee Benefits 4 Lecture, 3 hours; individual study, 1 hour; research, 1 hour; written work, 1 hour. Prerequisite(s): BUS 107. Provides a foundation of knowledge regarding employee benefits and the design and management of employee benefit plans. Discusses current issues and recent developments in the ever-changing field regarding employee benefits-related topics.

BUS 123 Spreadsheet Modeling For Decision-Making 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): BUS 104 or STAT 104. Introduces the fundamental techniques of using data to make informed management decisions in the presence of uncertainty. Utilizes advanced Microsoft Excel functionality.

BUS 124 Business Analytics 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): STAT 008 or STAT 010 or ECON 101. Provides fundamental concepts and tools needed to understand the emerging role of business analytics in organizations. Applies basic business analytics tools in a spreadsheet environment. Introduces market-leading techniques that help identify and manage key data from business processes. Provides the essential tools required for data mining and business process re-engineering.

BUS 125 Simulation For Business 4 Lecture, 3 hours; extra reading, 1.5 hours; activity, 1.5 hours. Prerequisite(s): BUS 104 or STAT 104; or equivalents. Introduces simulation as a tool for analyzing complex systems. Analyzes and discusses the theory and practice of modeling through simulation. Topics include modeling uncertainty and collecting input data, Monte Carlo simulation techniques, model verification and validation, and sensitivity analysis. Examines applications in finance, marketing, operations, and supply chain management.

BUS 126 Practical Business Forecasting 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): BUS 105; or consent of instructor. Teaches how forecasts are developed and utilized. Emphasizes common forecasting methods used in business and uses specific cases to illustrate these methods. Applications to business include forecasting sales, production, inventory, macroeconomic factors such as interest and exchange rates, and other aspects of both short- and long-term business planning.

BUS 127 Introduction to Quality Improvements 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 008 or STAT 010; or ECON 101. Explores Deming's 14 points for management, graphical methods, fishbone diagram, Pareto analysis, control charts for attributes and variables, cusum and moving average charts, and process-capability. Also covers economic design, acceptance sampling, Taguchi method, parameter design, tolerance design, reliability, hazard rate, censoring, and accelerated life testing. Cross-listed with STAT 127.

BUS 128 Project Planning and Control 4 Lecture, 3 hours; assigned problems and field project, 3 hours. Prerequisite(s): BUS 104/STAT 104 or consent of instructor. Covers issues related to planning and control. Explores the differences between projects and production systems; breakdown structures of project organization and work; sequencing and budgeting; resource management; project evaluation and control; and use of current project management software. Includes application of methodology to a real-world project.

BUS 129 Supply Chain Management 4 Lecture, 3 hours; assigned problems, 3 hours. Prerequisite(s): BUS 105. Focuses on management of the distribution of goods and services from plants, ports, and vendors to customers. Key topics include transportation, inventories, warehousing, materials handling, order processing, packaging, pricing, customer service standards, and warehouse and retail location.

BUS 130 Quantitative Business Decision Models 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): BUS 104 or BUS 105 or STAT 104. Covers the modeling and analysis of decision problems in supply chain management. Includes logistics network design, integration of supply chain operations, and supply and sourcing decisions. Utilizes the electronic spreadsheet as the principal device for building models, as well as addresses the

concepts of effective spreadsheet design and use. If BUS 130 has been completed with a passing grade with the title of "Supply Chain Modeling" the new BUS 130 "Quantitative Business Decision Models" may not be taken for credit.

BUS 131 Fixed-Income Securities 4 Lecture, 3 hours; research, 1 hour; extra reading, 2 hours. Prerequisite(s): BUS 133 or BUS 132; BUS 106 or ECON 134. Covers fixed-income securities and basic analytical tools in fixed-income markets. Topics include relative pricing of fixed-income securities, yield-curve estimation, securities with embedded options, and trading strategies. Utilizes instruments such as interest rate swaps, mortgage-backed securities, and credit derivatives.

BUS 132 Foundations of Finance 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): BUS 020; STAT 008 or STAT 010 or ECON 101; ECON 102 or ECON 103 or ECON 104A or ECON 105A. Covers the mathematical and economic foundations of finance. Topics include intertemporal production and consumption; fisher separation; risk and return; two-fund separation; standard asset-pricing models; arbitrage; derivatives concepts and parity relationships; and international finance parity relationships. Credit is awarded for one of the following BUS 132 or BUS 133.

BUS 133 Accelerated Foundations of Finance 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): BUS 020 with a grade of B or better, STAT 004 with a grade of B or better or STAT 008 with a grade of B or better or STAT 010 with a grade of B or better or ECON 101 with a grade of B or better; ECON 003 with a grade of B or better or ECON 003H with a grade of B or better; or a score of 3 or higher on the Advance Placement exam in Statistics; or consent of instructor. Covers materials from BUS 106/ECON 134 and BUS 132. Examines investment and operational decisions of individuals and companies. Covers relationship between investment decisions, wealth, and risk tolerance. Addresses operational decisions from the perspective of an entrepreneur or manager. Pursues strategies that personally appeal rather than investments that maximize shareholder value. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following BUS 133, or BUS 106/ ECON 134 and BUS 132.

BUS 134 Corporate Finance 4 Lecture, 3 hours; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): BUS 133 with a grade of C- or better; 2 of the following: ECON 134, BUS 106, BUS 132. Explores capital budgeting under uncertainty, cost of capital, capital structure, and basics of corporate governance. May cover other related topics. Provides an understanding of the theoretical issues related to these topics. Emphasizes formulating optimal financial decisions. May include case-method teaching and data analysis.

BUS 135 Corporate Financial Policy 4 Lecture, 3 hours; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): BUS 133 with a grade of C- or better or BUS 132 with a grade of C- or better; BUS 106 with a grade of C- or better or ECON 134 with a grade of C- or better. Covers application of option pricing in corporate finance, financial planning, working capital management, mergers and acquisitions, and risk management. May cover other related topics. Emphasizes formulating optimal financial decisions. May include case-method teaching and data analysis.

BUS 136 Investments: Security Analysis and Portfolio Management 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): BUS 133 with a grade of C- or better; 2 of the following: BUS 106, ECON 134, BUS 132. Provides a thorough study of the investment process. Topics include portfolio selection, asset-pricing models, term structure, and portfolio performance valuation. Discusses empirical uses of securities data and empirical issues in testing asset pricing models.

BUS 137 Investments: Derivatives Markets 4 Lecture, 3 hours; extra reading, 2 hours; activity, 1 hour. Prerequisite(s): BUS 133 with a grade of C- or better or BUS 132 with a grade of C- or better; BUS 106 with a grade of C- or better or ECON 134 with a grade of C- or better. Covers option market characteristics, option pricing theories, and speculative strategies used in local, national, and international markets. Analyzes other derivatives instruments including futures, forwards, and swaps. Discusses empirical uses of securities data related to derivatives markets.

BUS 138 International Finance 4 Lecture, 3 hours; extra reading, 2 hours; activity, 1 hour. Prerequisite(s): BUS 133 with a grade of C- or better or BUS 132 with a grade of C- or better; BUS 106 or ECON 134. A survey of international financial institutions and the financial factors that affect the modern multinational corporation. Covers trade and international investment theories and empirical analysis. Topics include the international financial systems, balance of payments, foreign exchange markets, measurement of foreign exchange risk, hedging, international asset pricing, and trade financing.

BUS 139 Real Estate Investments 4 Lecture, 3 hours; extra reading, 2 hours; activity, 1 hour. Prerequisite(s): BUS 133 or BUS 132; BUS 106 or ECON 134. Analysis of real estate development including consideration of site selection, market analysis, financing, design and construction, loan contracts, mortgage risks, and investment analysis.

BUS 140 (E-Z) Current Topics in Finance 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): BUS 106 or ECON 134 or BUS 133. Addresses contemporary issues in finance. Includes financial markets, private equity, asset pricing, performance evaluation, derivative securities, market micro structure, corporate finance, corporate control and governance, and the global economy. Explores recent developments in theoretical, empirical, and applied finance. Also addresses the regulatory and ethical environment of finance. Course is repeatable as content or topic changes to a maximum of 8 units.

BUS 140E Current Topics in Finance 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): BUS 106 with a grade of C- or better or ECON 134 or BUS 133. Focuses on the current financial crisis. Includes bank, investment bank, insurance company, and other financial institution failures and the government and market responses to them. Course is repeatable as content or topic changes to a maximum of 8 units.

BUS 141 Trading Strategies 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): BUS 133, BUS 136 or BUS 132, BUS 136, BUS 106 or ECON 134. Introduces stock market anomalies. Includes ways to predict market strength, to profit, and to understanding the risk and trading costs of performing such trading strategies. Considers the most well-known empirical deviations from the capital asset pricing model (CAPM) and trading strategies.

BUS 142 Banks and Risks of Financial Institutions 4 Lecture, 3 hours; extra reading, 2 hours; research, 1 hour. Prerequisite(s): BUS 132 or BUS 133; or consent of instructor. Examines financial institutions in the United States with an emphasis on banks and their competitors. Focuses on the risks these institutions are exposed to and their sources. Topics include deposits, loans, regulation, interest rate risk, credit risk, mutual funds, hedge funds, insurance, and pension funds.

BUS 143 Judgment and Decision Making 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Covers decision making, including thinking and judgments; information selection and evaluation; learning and memory; the social side of judgment and decision making; fairness, moral obligations, and social dilemmas; and decision making in organizations.

BUS 144 Negotiation Fundamentals 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): BUS 107. Develops an understanding of the theory and processes underlying a broad spectrum of negotiation problems. Attains competency in negotiations by applying analytic and interpersonal skills covered in readings and lecture to regular exercises and debriefings.

BUS 145 Designing and Leading Teams 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): BUS 107; or consent of instructor. A general survey of the dynamics and effective management of teams within organizations. Explores the nature of teamwork through the creation of shared goals and actions to facilitate organizational effectiveness. Addresses the roles of individuals in teams. Enhances theoretical knowledge of teams through critical application in real-team situations.

BUS 146 Introduction to Entrepreneurship 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Discusses the nature of entrepreneurship and its role in the economy. Topics include identifying and evaluating

business opportunities, creating a team, and acquiring financial and other necessary resources.

BUS 147 Entrepreneurial Finance 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): BUS 133 with a grade of C- or better or BUS 132 with a grade of C- or better; BUS 106 with a grade of C- or better or ECON 134 with a grade of C- or better. Focuses on the financing of entrepreneurial ventures. Provides an understanding of opportunity recognition skills, funding techniques, and institutions involved in the financing of new ventures. Includes financial modeling, cash needs assessment, valuation, deal structure, financing alternatives, simulation, and harvesting.

BUS 148 Business Plan Development 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): BUS 107; or consent of instructor. Provides the skills necessary to assess new venture opportunities and convert them into businesses.

BUS 149 Advanced Topics in Management and Decision-Making 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): BUS 107; or consent of instructor. Covers advanced topics in management and decision-making. Includes incentives and motivation, social labor, the psychology of money, competition and markets, grey marketing and revenge, dishonesty and cheating, decision-making in groups, other-regarding preferences, and welfare inferences and well-being.

BUS 150 Corporate Strategic Analysis in Multi-Business Firms 4 Lecture, 3 hours; written work, 2 hours; extra reading, 1 hour. Prerequisite(s): BUS 109, may be taken concurrently; or consent of instructor. Explores the distinct challenges multi-business organizations face when creating and reviewing their corporate-level strategies. Topics include mergers and acquisitions, alliances, outsourcing, reorganizations, diversification, and change implementation. Emphasizes how top management can identify opportunities, define the corporate headquarter's role, and create value for the businesses it holds.

BUS 151 Brand Management 4 Lecture, 3 hours; research, 1 hour; written work, 2 hours. Prerequisite(s): BUS 103 or consent of instructor. Provides an understanding of how to manage a brand or a branded product. Topics include brand development and equity, brand architecture and brand leveraging, and managing a brand over the product life cycle.

BUS 152 Sales Management 4 Lecture, 3 hours; research, 1 hour; written work, 2 hours. Prerequisite(s): BUS 103. Discusses strategic and tactical aspects of sales force management including sales force planning, deployment, compensation, and control. Also covers selling strategies and managing of customer relationships.

BUS 153 Labor Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. An analysis of labor demand, labor supply, market equilibrium, and policies affecting each. Topics include labor supply, labor demand, minimum wages, government transfers, education, job training, and discrimination. Cross-listed with ECON 153.

BUS 154 Business Law 4 Lecture, 3 hours; extra reading, 1.5 hours; term paper ,1.5 hours. Prerequisite(s): upper-division standing. Studies law as an integral part of the business environment, a process derived from and changing with the larger society. Areas covered include contracts, torts, agency, partnerships, corporations, and bankruptcy.

BUS 155 Managing Human Resources 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): BUS 107; or consent of instructor. Applies a strategic planning approach to managing relations between an organization and its human resources. Topics include processes of forecasting and job analysis, environmental scanning, recruitment and selection, evaluation and compensation, and dispute resolution.

BUS 156 Leadership Development 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): BUS 107; or consent of instructor. Analyzes leadership theory and practice. Surveys areas pertaining to leadership, such as leadership theory, leadership style, oral and written communication, ethical leadership, interpersonal conflict management, and the dynamics of culture and gender in organization leadership.

BUS 157 Managing Work Force Diversity 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): BUS 107; or consent of instructor. Covers management topics for understanding how to navigate, manage, and lead diverse organizations more effectively. Topics include diversity in organizations, cross-cultural management, research-based strategies for reducing bias in organizations, and workplace inclusion.

BUS 158 Organizations as Cultural Systems 4 Lecture, 6 hours; extra reading and written exercises, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the role of culture in the formation and management of complex bureaucratic organizations. Covers types of organizations and organizational cultures, the impact of the cultural environment, and problems posed by rapid cultural change. Offered in summer only. Cross-listed with ANTH 105.

BUS 159 New Product Development 4 Lecture, 3 hours; research, 1 hour; written work, 2 hours. Prerequisite(s): BUS 103 or consent of instructor. Examines the strategies that lead to successful development of new products. Discusses the tools and techniques used in different stages of a successful new product development process from opportunity identification to market testing and commercialization of the new product.

BUS 160 Industrial Organization 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 104B. A study of the organization and structure of the American industrial system. Emphasizes production and pricing behavior and policies. Also addresses market structure and public policies regulating or influencing market behavior. Cross-listed with ECON 160.

BUS 161 Forensic and Fraud Auditing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 165B. An introduction to forensic accounting and fraud examination and how they pertain to both civil and criminal matters. Covers the characteristics of fraud, fraud prevention and detection, investigative techniques, asset recovery, and the use of information technology.

BUS 162 Managerial Economics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 102 or ECON 104A. Examines applications of economic analysis to problems of management, especially of capital. Emphasis is on production economics and cost analysis. Cross-listed with ECON 162.

BUS 163 Technology Entrepreneurship 4 Lecture, 3 hours; extra reading, 1 hour; research, 1 hour; term paper, 1 hour. Prerequisite(s): BUS 101. Provides a process of starting a new technology-based venture from the original idea to commercialization. Introduces a set of cross-functional concepts in technology management, intellectual property laws, marketing, operations and strategy. Concepts apply to a class project focused on the development of a business plan for a technology-based startup.

BUS 164 Marketing Strategy 4 Lecture, 3 hours; research, 1 hour; written work, 2 hours. Prerequisite(s): BUS 103 or consent of instructor. Focuses on planning and development of marketing and product portfolio strategies for long-term success. Emphasizes marketing analysis and decision-making through the use of case studies and/or a computer-based marketing simulation.

BUS 165A Intermediate Financial Accounting 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): BUS 021 or equivalent. In-depth study of financial accounting theory and practice. Develops an understanding of accounting concepts and generally accepted accounting principles and the ability to apply this technical knowledge to solve accounting problems. Topics include principal financial statements and accounting and valuation of various assets.

BUS 165B Intermediate Financial Accounting 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): BUS 165A. A continuation of study of financial accounting theory and practice. Topics include current liabilities and contingencies, long-term liabilities, contributed capital, retained earnings, and temporary and long-term investments.

BUS 165C Intermediate Financial Accounting 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): BUS 165B. A continuation of study of financial accounting theory and practice. Covers the conceptual discussion and procedural presentation of financial accounting topics as well as recent developments in accounting valuation and reporting practices promulgated by practitioners in industry and public accountants.

BUS 166 Accounting Information Systems 4 Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 101, BUS 108, or equivalents. Study of the concepts and techniques in the design and implementation of accounting information systems within companies' operating environments. Emphasis is on the effects of the computer on these systems.

BUS 167 Advanced Financial Accounting 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): BUS 165C (may be taken concurrently). Covers advanced accounting topics such as consolidated financial statements, accounting for multinational corporations, partnership accounting, and accounting for nonprofit organizations.

BUS 168A Individual Taxation 4 Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 108 or equivalent. Concentrates primarily on the basic provisions of the federal income taxes imposed on individuals and the accounting for those taxes. While the major emphasis is on current tax provisions and tax planning, consideration is also given to the legislative and judicial development of these provisions.

BUS 168B Federal Taxation For Corporations, Partnerships, Estates, and Trusts 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): BUS 168A. Covers tax research, corporate taxation, partnership taxation, the wealth transfer taxes, income taxation of estates and trusts, international taxation, and tax administration.

BUS 169A Auditing 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): BUS 165B, may be taken concurrently; or consent of instructor. Covers the auditing environment, the auditor's legal liability, audit responsibilities and objectives, audit evidence, audit planning and documentation, the auditor's report, and management letters.

BUS 169B Quality Assurance in Auditing 4 Lecture, 3 hours; case analyses, 3 hours. Prerequisite(s): BUS 169A. Covers the audit process (internal control, compliance tests, sampling, substantive evidence gathering, electronic data processing auditing) and the audit procedures for various types of accounts such as sales, cash, accounts receivable, payroll, inventory, and capital acquisitions.

BUS 170 Financial Statement Valuation 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): BUS 165B, may be taken concurrently; or consent of instructor. Explains weighted average cost of capital as used in operating income based, revenue based, and market based valuation methods. Requires research to determine valuation of an existing publicly held company under all three methods. Also considers off balance sheet financing, credit risk analysis, and minority interests.

BUS 171 Systems Analysis and Design 4 Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 101 or equivalent. Involves detailed analysis, specification, design, and implementation of computer-based information systems. Includes economic analyses, evaluation of alternatives, analysis or design tools, and systems project management and planning. Case studies are used.

BUS 172 Information Economics 4 Lecture, 3 hours; assigned cases and project, 3 hours. Prerequisite(s): BUS 103; ECON 003 or ECON 003H. Discusses economic concepts and strategies related to the network economy. Topics include economic issues surrounding information goods, competition in electronic business, pricing strategies, and intellectual property protections. Examines business strategies for the information (software) and infrastructure (hardware) elements of electronic business.

BUS 173 Introduction to Databases For Management 4 Lecture, 3 hours; extra reading, 2 hours; projects, 1 hour. Prerequisite(s): BUS 101 or equivalent. Covers physical and conceptual aspects of database management systems, including familiarity with the variety of database systems based on different data models. Examines the role of database systems in management information systems (MIS) and issues in database design for effective support of MIS. Requires the use of a database package.

BUS 174 Electronic Commerce 4 Lecture, 3 hours; extra reading, 2 hours; project, 1 hour. Prerequisite(s): BUS 101. Reviews the technological evolution of electronic commerce (EC). Investigates how EC can be used to interact with customers, other organizations, and those within the organization. Studies technical innovations, provides a critical evaluation of strategies, and examines current applications and their impact on the business environment.

BUS 175 Business Data Communications 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): BUS 101. Surveys components of telecommunication systems; examines major design and analysis issues in the development and implementation of computer communication systems. Studies both voice and data communication systems including local area networks, wireless systems, satellite systems, and distributed computer and database systems. Emphasizes evaluation of these systems for business purposes.

BUS 176 The Sociology of Work in Organizations 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. Emphasizes the roles of individuals in organizations. Topics include the effects of jobs on workers, long-term trends in the nature of work, and differences in work among major segments of the labor force. Cross-listed with SOC 176.

BUS 177 Labor Relations 4 Lecture, 3 hours; extra reading, 1 hour; written work, 1 hour; research, 1 hour. Prerequisite(s): BUS 010. Explores the foundation of knowledge regarding labor in the United States. Emphasizes the historical development of unionism, labor legislation, union structure, bargaining issues, contract negotiations and administration, and labor-management relations.

BUS 178 International Trade 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. A study of the pure theory of trade, trade policy, and international factor movements. Includes illustrative applications to current issues and problems. Cross-listed with ECON 178.

BUS 179 Business Application of Geographic Information Systems 4 Lecture, 2 hours; laboratory, 1 hour; extra reading, 2 hours; written work, 3 hours. Prerequisite(s): BUS 101. Includes introduction to and use of geographic information system (GIS) for business applications. Provides basic understanding on how location information is used in business processes for decisions. Offers an opportunity to gain hands-on experience with basic functionality of industry standard business mapping software tools including ArcGIS and Business Analyst Online.

BUS 181 Business Modeling and Optimization 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): STAT 008 or STAT 010 or ECON 101; restricted to class level standing of junior, or senior; or consent of instructor. Teaches the analytical approach to business decision making and performance improvement. Focuses on how to structure and analyze business problems to arrive at optimal solutions and compelling insights. Covers applications in marketing, operations, supply chain, and finance. Techniques include probability, statistics, and optimization.

BUS 182 Business Data Analytics and Visualization 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): STAT 008 or STAT 010 or ECON 101. Teaches statistical methods for descriptive, predictive, and prescriptive analysis. Provides opportunities to apply these acquired skills in various business applications in operations, finance, and marketing. Utilizes tools such as R Programming for data analysis and Tableau for data visualization.

BUS 183 Business Intelligence For Analytical Decisions 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): BUS 101; or consent of instructor. Demonstrates an understanding of the processes and techniques of business data collection, analysis, and visualization. Explains and applies the logic of optimization and

attribution in business intelligence. Also explains the terminology and tools of business intelligence. Facilitates understanding of machine learning and deep learning as part of artificial intelligence.

BUS 186 Social Network Analytics 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): BUS 104, BUS 107; or consent of instructor. Increases conceptual knowledge of social network principles. Diversifies abilities to compile, measure, and manage network data. Develops a toolkit for analyzing characteristics of individuals, relationships, and groups. Expands technical knowledge for using network characteristics to predict both individual behavior and group and population outcomes.

BUS 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): upper-division standing; consent of instructor and program chair. A project to be undertaken under faculty supervision. Course is repeatable to a maximum of 12 units.

BUS 198 R'course - Variable Topics 1 Activity, 3 hours. Prerequisite(s): permission needed from the department; restricted to class level standing of sophomore, junior, or senior. An opportunity for UCR undergraduate students to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original course topics are variable and unique from other departmental course offerings, designed to highlight the student facilitators' expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content or topic changes to a maximum of 8 units.

BUS 198I Individual Internship in Business Administration 1 to 12 Seminar, 1 hour; internship, 3 to 36 hours; term paper, 1 to 11 hours. Prerequisite(s): restricted to class level standing of junior, or senior; restricted to major(s) Business Administration; and consent of instructor. Provides active participation in the work of a business concern or a public or quasi-public agency. Combines academic instruction and supervised field experience. A maximum of 4 quarter units may be counted toward the degree requirements for Business Administration. Course is repeatable to a maximum of 16 units.

BUS 199H Senior Honors Research 1 to 5 Seminar, 1 hour; extra reading, 2 to 12 hours; term paper, 2 to 12 hours. Prerequisite(s): senior standing with a major in Business Administration; admission to University Honors or consent of instructor. Involves research in business administration under faculty supervision. Students submit a written report. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is awarded. Course is repeatable to a maximum of 12 units.

Business Analytics

Subject abbreviation: BSBA
The School of Business

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Professors

Subramanian 'Bala' Balachander, Ph.D. *Albert O. Steffey Chair* (Marketing)
Margaret Campbell, Ph.D. *Associate Dean and Department Chair, and A. Gary Anderson Family Foundation Endowed Presidential Chair* (Marketing)
Hai Che, Ph.D. (Marketing)
Mohsen El-Hafsi, Ph.D. (Operations and Supply Chain Management)
Long Gao, Ph.D. (Operations and Supply Chain Management)
Jerayr 'John' Haleblian, Ph.D. *Associate Dean, and A. Gary Anderson Family Foundation Endowed Presidential Chair in Business Administration* (Management)
Jean Helwege, Ph.D. *Philip L. Boyd Endowed Chair in Finance* (Finance)
Thomas Kramer, Ph.D. *Associate Dean for the Academic Undergraduate Programs and A. Gary Anderson Family Foundation Endowed Presidential Chairs in Business Administration* (Marketing)
Birendra Mishra, Ph.D. (Accounting)
Ashutosh Prasad, Ph.D. (Marketing)
Yunzeng Wang, Ph.D. *Dean's Distinguished Scholar* (Operations and Supply Chain Management)
Rami Zwick, Ph.D. *Associate Dean for the Academic Graduate Programs* (Marketing)
Elodie Goodman, Ph.D. (Operation and Supply Chain Management)
Ivy Zhang, Ph.D. (Accounting and Information System)

Professors Emeriti

Bajis M. Dodin, Ph.D. (Operations and Supply Chain Management)
Woody Liao, Ph.D. (Accounting)
Kathleen Montgomery, Ph.D. *Distinguished Professor* (Management)
Michael Moore, Ph.D. (Accounting)
Waymond Rodgers, Ph.D. (Accounting and Information Systems)
David Stewart, Ph.D. *Distinguished Professor* (Marketing)
Richard Smith, Ph.D. (Finance)
Theodore Mock, Ph.D. *Distinguished Professor* (Accounting)

Associate Professors

Richard Carrizosa, Ph.D. (Accounting)
Michael Haselhuhn, Ph.D. (Management)
Hyun 'Shana' Hong, Ph.D. (Accounting)
Yawen Jiao, Ph.D. (Finance)
Mingyu 'Max' Joo, Ph.D. (Marketing)
Ye Li, Ph.D. (Management)
Boris Maciejovsky, Ph.D. (Management)
Adem Orsdemir, Ph.D. (Operations and Supply Chain Management)
Marlo Raveendran, Ph.D. (Management)
Ashish Sood, Ph.D. (Marketing)
Danko Turcic, Ph.D. (Operations and Supply Chain Management)
Elaine Wong, Ph.D. (Management)
Alexander Barinov, Ph.D. (Finance)

Assistant Professors

Eric Allen, Ph.D. (Accounting)
Mengmeng Dong, Ph.D. (Finance)
Scott Ganz, Ph.D. (Management)
Hyeik Kim, Ph.D. (Finance)
Demetrius Lewis, Ph.D. (Management)
Mindy Truong, Ph.D. (Management)
Aruhn Venkat (Accounting)

Associate Professor of Teaching

Greg Richey, Ph.D. (Finance)

Assistant Professor of Teaching

Kyle Ingram, Ph.D. (Management)
Jonathan Lim, Ph.D. (Marketing)
Sanjoy Moulik, Ph.D. (Information Systems)
Rich Yueh, Ph.D. (Information Systems)

Lecturers

Arturo Alcaraz (Management)
Daniel Amendarez (Accounting)
Suri Gurumurthi (Operations and Supply Chain Management)
Sean Jasso, Ph.D. (Management and Marketing)
Hoyul Paik (Finance)
Jonathan Pittard, M.B.A. (Accounting)
Raj Singh, Ph.D. (Management)
Kan Wang (Information Systems)

Business Analytics Major

Lower division requirements (10 courses [at least 38 units]) Major prerequisites (non-BUS courses may be used to satisfy breadth requirements for the School of Business):

- BUS 010
- BUS 020
- BUS 098
- CS 009A
- CS 009B
- ECON 003
- STAT 008 or STAT 010
- MATH 009A
- MATH 009B
- MATH 009C

The major requirements for the B.S. in Business Analytics are as follows:

Upper-division major requirements (23 courses [at least 90 units])

BUS 100W, BUS 101, BUS 102, BUS 103, BUS 104/ STAT 104, BUS 105, BUS 106, BUS 107, BUS 109, BUS 110, BUS 115, BUS 119, BUS 123, BUS 124A, BUS 124B, BUS 125, BUS 129, BUS 130, BUS 173, BUS 198i, STAT 160A, STAT 160B, STAT 160C

Capital Internships

Subject abbreviation: UCDC
Division of Undergraduate Education

Dr. Louie F. Rodriguez, Ed.D., Faculty Advisor
(951) 827-7942
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The UC Washington Center (UCDC) Academic Internship Program provides undergraduate students with a multi-dimensional educational experience in Washington, D.C. Students undertake academic pursuits as well as cultural and social activities. The program combines course work with field research and internship experience. Students also have the opportunity to tour local sites and dialogue with distinguished professionals in the Speaker Series. For more information see UC Washington Center (UCDC) Academic Internship Program in the front of this catalog. For more information on application requirements, visit ucdc.ucr.edu.

Curriculum
The UCDC program is open to all undergraduate students in all majors with upper-division Junior/Senior standing and a 2.7 cumulative GPA. All UCDC participants remain UCR students during the program. Students must be accepted into the UCDC program, be residents of the UC Washington Center, and enroll in an academic internship taking place in the Washington, D.C. region in order to participate in the UCDC curriculum.

During the Fall, Winter, and Spring quarters, students are enrolled in full-time credit units comprising internship units, a seminar, and an optional elective course. For summer enrollments, please consult with the program staff at UCR.

Internship (8-16 units)
The focal point of the academic program is the internship, which is based on the students' interests and major, and it is arranged before the student leaves for Washington, D.C. Students must enroll in a 198I course, which is usually taken in the student's major department. This course is letter graded.

Core Research Seminar (4 units)
UCR students must enroll in a seminar from the UCDC 191 A-M series. Students meet weekly with an instructor and conduct research linked to their internship. Students must take seminars for a letter grade only, and should consult with their major department concerning the applicability of UCDC seminars to major requirements.

Elective (4 units)
Students may select courses from the UCDC 150-159 series. These courses are letter-graded. Students should consult with their major department about the applicability of UCDC electives to major requirements.

Upper-Division Courses

UCDC 150 Special Topics in Political Science 4 Lecture, 3 hours; term paper, 2 hours; research, 1 hour. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Addresses topics in Political Science from the perspective of politics in Washington, D.C. Topics vary each term and may be viewed at https://www.ucdc.edu. Course is repeatable to a maximum of 8 units.

UCDC 151 Special Topics in International Relations 4 Lecture, 3 hours; term paper, 2 hours; research, 1 hour. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior; and consent of instructor. Addresses topics in International Relations from the perspective of politics in Washington, D.C. Topics vary each term and may be viewed at https://www.ucdc.edu. Course is repeatable to a maximum of 8 units.

UCDC 152 Special Topics in Social Science 4 Lecture, 3 hours; term paper, 2 hours; research, 1 hour. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Addresses topics in the social sciences from the perspective of Washington, D.C. Topics vary each term and may be viewed at https://www.ucdc.edu. Course is repeatable to a maximum of 8 units.

UCDC 153 Special Topics in Economics and Business 4 Lecture, 3 hours; term paper, 2 hours; research, 1 hour. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Addresses topics in business and economics from the perspective of Washington, D.C. Topics vary each term, and may be viewed at https://www.ucdc.edu. Course is repeatable to a maximum of 8 units.

UCDC 154 Special Topics in Arts 4 Lecture, 3 hours; term paper, 2 hours; field, 1 hour. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Addresses topics in the arts from the perspective of Washington, D.C. Topics vary each term, and may be viewed at http://www.ucdc.edu. Course is repeatable to a maximum of 8 units.

UCDC 155 Special Topics in Humanities 4 Lecture, 3 hours; term paper, 2 hours; research, 1 hour. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Addresses topics in the humanities from the perspective of Washington, D.C. Topics vary each term and may be viewed at https://www.ucdc.edu. Course is repeatable to a maximum of 8 units.

UCDC 156 Special Topics in History 4 Lecture, 3 hours; term paper, 2 hours; research, 1 hour. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Addresses topics in history from the perspective of Washington, D.C. Topics vary each term, and may be viewed at https://www.ucdc.edu. Course is repeatable to a maximum of 8 units.

UCDC 157 Special Topics in Media and Communications 4 Lecture, 3 hours; term paper, 2 hours; research, 1 hour. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Addresses topics in media and communications from the perspective of Washington, D.C. Topics vary each term and may be viewed at https://www.ucdc.edu. Course is repeatable to a maximum of 8 units.

UCDC 158 Special Topics in Science, Technology, Engineering and Mathematics 4 Lecture, 3 hours; term paper, 2 hours; research, 1 hour. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Addresses topics in the natural sciences, technology, engineering, and mathematics from the perspective of Washington, D.C. Topics vary each term and may be viewed at https://www.ucdc.edu. Course is repeatable to a maximum of 8 units.

UCDC 159 Washington Special Topics 4 Lecture, 3 hours; term paper, 2 hours; research, 1 hour. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Addresses topics relevant to Washington, D.C. from an interdisciplinary or non-disciplinary perspective. Topics vary each term and may be viewed at https://www.ucdc.edu. Course is repeatable to a maximum of 8 units.

UCDC 191A Seminar For General Research 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Complements the internship experience of participants in the UCDC program by connecting their internship experience to a focused research project. Guides students through the process of conducting focused and detailed research. For more course information, visit https://www.ucdc.edu. Satisfactory(S) or No Credit(N/C) is not available.

UCDC 191B Seminar On Congress 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Explores how Congress works including representation of constituents, congressional elections, internal rules, the role of parties, executive branch relations, and policymaking. Complements

the experiences of UCDC Capitol Hill interns. Provides guidance through the process of conducting focused and detailed research. For more course information, visit https://www.ucdc.edu. Satisfactory(S) or No Credit(N/C) is not available.

UCDC 191C Seminar On the Presidency and Executive Branch 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Examines American presidential leadership and the evolving role of the presidency in American culture. Introduces major thematic debates that define presidential politics. Complements experiences of UCDC interns in the Executive Branch. Provides guidance through the process of conducting focused and detailed research. For more course information, visit https://www.ucdc.edu. Satisfactory(S) or No Credit(N/C) is not available.

UCDC 191D Seminar in Environmental Policy 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Covers theoretical perspectives and methodological approaches used in determining the environmental sustainability of various public policies. Complements interns whose experiences relate to the environment by connecting and guiding through a focused and detailed research project. For more course information, visit https://www.ucdc.edu. Satisfactory(S) or No Credit(N/C) is not available.

UCDC 191E Seminar in International Policy 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Investigates the complex policy community (governmental, non-governmental, and intergovernmental actors) that engages in forging international policy. Complements students whose internships relate to foreign policy by connecting their internship experience to a focused and detailed research project. For more course information, visit https://www.ucdc.edu. Satisfactory(S) or No Credit(N/C) is not available.

UCDC 191F Seminar On the Washington Media 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Explores the rapidly changing relationship between the news media, political communication, and governing. Complements interns whose experiences relate to the media by connecting to a focused and detailed research project. For more course information, visit https://www.ucdc.edu. Satisfactory(S) or No Credit(N/C) is not available.

UCDC 191G Seminar On the Arts in Washington 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Addresses how the arts function in American institutions and society as well as how to improve on this constantly shifting interface. Complements interns with experiences in the arts by connecting to a focused and detailed research project. For more course information, visit https://www.ucdc.edu. Satisfactory(S) or No Credit(N/C) is not available.

UCDC 191H Seminar in Health Policy 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Honors course corresponding to UCDC 191H. Examines the shape of the U.S. healthcare system and the trail of public health care policies. Complements interns who experiences relate to health care by connecting to a focused and detailed research project. For more course information, visit https://www.ucdc.edu.

UCDC 191I Seminar On the United States Supreme Court 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Introduces the Supreme Court of the United States as a legal, political, and cultural institution. Complements interns whose experiences relate to law and the courts by connecting to a focused and detailed research project. For more course information, visit https://www.ucdc.edu. Satisfactory(S) or No Credit(N/C) is not available.

UCDC 191M Seminar in Washington, D.c. 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): admission to the UC Washington Center (UCDC) Academic Internship Program; restricted to class level standing of junior, or senior. Examines aspects of the Washington, D.C., area including cultural, political, and governmental institutions as well as the sciences, arts, and media. Includes guided independent work drawing on the unique aspects of Washington, D.C. For more course information, visit https://www.ucdc.edu. Satisfactory(S) or No Credit(N/C) is not available.

Cell Biology and Neuroscience

Subject abbreviation: CBNS
College of Natural and Agricultural Sciences

Michael E. Adams, Ph.D., Chair
Viji Santhakumar, Ph.D., Vice Chair
Department Office, 2710 Life Sciences, Psychology Bldg.
(951) 827-5903; mcsb.ucr.edu

Professors

Michael E. Adams, Ph.D. (Molecular, Cell and Systems Biology/Entomology)
Margarita C. Currás-Collazo, Ph.D.
Anupama Dahanukar, Ph.D.
Karine G. Le Roch, Ph.D.
Morris Maduro, Ph.D.
Manuela Martins-Green, Ph.D.
Anandasankar Ray, Ph.D.
Viji Santhakumar, Ph.D.
Frances M. Sladek, Ph.D.
Nicole zur Nieden, Ph.D.

Professors Emeriti

David A. Eastmond, Ph.D.
Sarjeet S. Gill, Ph.D., Professor of the Graduate Division
Dmitri Maslov, Ph.D.
B. Glenn Stanley, Ph.D. (Molecular, Cell and Systems Biology/Psychology)
Prudence Talbot, Ph.D.
Raphael Zidovetzki, Ph.D.

Associate Professors

Jeffrey B. Bachant, Ph.D.
Jun-Hyeong Cho, M.D., Ph.D.
Todd Fiacco, Ph.D.
Weifeng Gu, Ph.D.
Sachiko Haga-Yamanaka, Ph.D.
Fedor V. Karginov, Ph.D.
Constance I. Nugent, Ph.D.
Martin Riccomagno, Ph.D.
Hongdian Yang, Ph.D.

Assistant Professors

Garret R. Anderson, Ph.D.
Bryan Brown, Ph.D.
Pooja Flora, Ph.D.
Yan Hong, Ph.D.
Huimin Zhang, Ph.D.
Ting Zhao, Ph.D.

Associate Professor of Teaching

Scott N. Currie, Ph.D.

Assistant Professor of Teaching

Brian Duistermars, Ph.D.

Research in the Department of Molecular, Cell and Systems Biology uses multidisciplinary approaches to understanding basic cellular processes in various tissues, including the nervous system, as well as more integrative levels of analysis, including behavior. Areas of research represented in the department include the following:

- Biophysical properties of excitable membranes
- DNA repair
- Transcriptional regulation
- Mechanisms of toxicity
- Insect development
- Membrane transport
- Mechanisms of mitotic chromosome

transmission
- Telomere maintenance
- Synaptic structure and function
- Changes in nervous system with experience
- Interactions of nervous and endocrine systems
- Reproductive biology and fertilization
- Cell and molecular mechanisms of response to injury
- Glia-neuron signaling and sensory and motor integrative processes
- RNA Biology

Undergraduate Curriculum

Students interested in Cell Biology and Neuroscience with Molecular, Cell, and Systems Biology can obtain training through the interdepartmental major in Cell, Molecular, and Developmental Biology leading to the B.S. degree. Students interested in neuroscience can obtain training in behavioral neuroscience, neurobiology, and neurochemistry through the Neuroscience major leading to the B.A. or B.S. degree. The Neuroscience major is an intercollege major offered by the College of Humanities, Arts, and Social Sciences and the College of Natural and Agricultural Sciences. See Cell, Molecular, and Developmental Biology section and Neuroscience Undergraduate Major section, respectively.

Graduate Curriculum

Courses and research opportunities are offered by the graduate programs in Cell, Molecular, and Developmental Biology; Environmental Toxicology; and Neuroscience. See the respective graduate program section.

Lower-Division Courses

CBNS 004 Concepts in Medical Cell Biology 3 Lecture, 1 hour; workshop, 4 hours. Prerequisite(s): MATH 003 with a grade of C- or better or MATH 006A, may be taken concurrently or MATH 06LA, may be taken concurrently or MATH 006B, may be taken concurrently or MATH 005A, may be taken concurrently or MATH 007A, may be taken concurrently or MATH 009A, may be taken concurrently or MATH 007B, may be taken concurrently or MATH 009B, may be taken concurrently or STAT 010 with a grade of C- or better; or equivalent; restricted to major(s) Cell, Molecular, and Developme, Undeclared-Life Sciences; or consent of instructor. Introduces fundamental concepts in molecular cell biology, with emphasis on human health and disease. Modules involve lectures and interactive, problem-oriented activities with faculty. Through classical and contemporary examples, students become acquainted with the scientific process as they discover insights into human biology and genetics.

CBNS 010 The Human Brain: A User's Guide 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to contemporary neuroscience. Topics include foundational principles of brain organization, nerve and glial cell form and function, synaptic transmission, and the neural mechanisms underlying human behavior and physiology. Discusses neuroscience methods and neurological diseases and disorders. Intended for non-science majors. Science majors are not encouraged to take this course. Credit is not awarded for CBNS 010 if it has already been awarded for CBNS 106 or PSYC 110.

Upper-Division Courses

CBNS 101 Fundamentals of Cell Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC and BCH 100 or BCH 110A or BCH 110HA (BCH 100 or BCH 110A or BCH 110HA may be taken concurrently). Introduces the principles of eukaryotic cell biology. Includes an examination of the molecules and systems that mediate cell function and an overview of membrane architecture and function, cell signaling and signal transduction, the cytoskeleton, organelles, protein targeting and secretion, and the nucleus and nuclear transport. Credit is not awarded for CBNS 101 if it has already been awarded for BIOL 113 or BIOL 114.

CBNS 106 Introduction to Neuroscience 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A and BIOL 005B with grades of "C-" or better, CHEM 001A, CHEM 001B, CHEM 001C; or consent of instructor. An introduction to cellular, organismal, and behavioral neuroscience for science majors. Topics include structure and functions of the brain, neurons, and synapses; sensory systems and perception; control of movement; neurobiology of hormones and sexual behavior; biorhythms; learning; memory; and psychoses.

CBNS 108 Introduction to Developmental Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC; or consent of instructor. Emphasizes common principles and key concepts that govern development of multiple eukaryotic systems, and how genes control cell behavior during development.

CBNS 109 Epigenetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102. Introduction to mechanisms that cause a heritable change in phenotype without a change in the genetic code. Covers DNA modifications, histone modifications, and noncoding RNAs that influence the expression, maintenance, and inheritance of traits. Discusses impacts of epigenetics on multicellular life such as learning, memory, disease, and crosstalk with environments. Cross-listed with BPSC 109.

CBNS 116 Human Neuroanatomy: Structure-Function Relationships 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 with a grade of "C-" or better or consent of instructor. Provides in-depth study of human functional neuroanatomy including gross anatomy of the brain and spinal cord, microscopic anatomy (histology) of cellular components, and fine structure of the nervous system at the electron microscope (EM) level. Emphasizes understanding the neuroanatomy of key structures (e.g., hypothalamus, brainstem, hippocampus).

CBNS 120 Cellular Neuroscience: Membrane and Synaptic Phenomena 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or consent of instructor. An examination of cellular and molecular mechanisms of nervous system function using concepts drawn from the study of vertebrates and invertebrates with emphasis on mammalian systems. Cross-listed with PSYC 120.

CBNS 120L Neuroscience Laboratory 4 Lecture, 1 hour; discussion, 1 hour; laboratory, 3 hours; written work, 3 hours. Prerequisite(s): CBNS 120, may be taken concurrently or PSYC 120, may be taken concurrently; or consent of instructor. Laboratory experiments using electrophysiological, chemical, and anatomical research methods fundamental to understanding neurons and neural systems. Cross-listed with PSYC 120L.

CBNS 121 Developmental Neuroscience 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or consent of instructor. A study of the development of nervous systems. Examines the cellular and molecular mechanisms of neural development and the determinants of cell birth and death, axonal pathfinding, neuronal connections, and development of neural systems underlying behavior. Cross-listed with PSYC 121.

CBNS 124 Systems Neuroscience 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 with a grade of C- or better; or consent of instructor. A study of the structure and function of motor and sensory systems in vertebrate and invertebrate nervous systems. Cross-listed with PSYC 124.

CBNS 125 Neuropharmacology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 120/PSYC 120. Examines synaptic neurotransmitter systems, mechanisms, and pharmacological agents and effects, which are fundamental to neural information processing. Cross-listed with PSYC 125.

CBNS 126 Neuroscience of Learning and Memory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or PSYC 110; or consent of instructor. Covers mechanisms of learning and memory across levels of analysis including genetic, neuronal, systems, and theory. Topics include the multiple memory systems, memory consolidation, working memory, emotional memory, recognition memory, spatial memory, and human amnesia. Cross-listed with PSYC 126.

CBNS 127 Behavioral Control Systems 4 Lecture, 3 hours; discussion 1 hour. Prerequisite(s): CBNS 120/PSYC 120; CBNS 124/PSYC 124 strongly recommended. An analysis of neural mechanisms that underlie behavior, concentrating on motor control. Topics range from command systems, to central pattern generators, to cortical control of voluntary movement and brain-machine interfaces (neuroprosthetics). Cross-listed with PSYC 127.

CBNS 128 Immunology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; PHYS 002C or PHYS 02HC; PHYS 02LC

or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA. A study of humoral and cellular immunology. Topics include lymphoid systems, cells, antigens, antibodies, antibody formation, cellular immunity, and tumor and transplantation immunology. Discusses in detail diseases and altered immune states associated with each topic. Cross-listed with BIOL 128.

CBNS 129 Brain Control of Bodily Functions 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 124/PSYC 124 with a grade of "C-" or better or consent of instructor. Emphasizes principles of organization and function related to endocrine and other physiological systems. Selected topics include control of breathing, body water, temperature, cardiovascular function, and the stress response.

CBNS 130L Computational Neurophysiology Laboratory: Simulating Neuronal Membrane Properties 4 Lecture, 1 hour; discussion, 1 hour; laboratory, 3 hours; written work, 3 hours. Prerequisite(s): CBNS 106; CBNS 120, may be taken concurrently or PSYC 120, may be taken concurrently; and consent of instructor. Introduces computer modeling techniques to enhance understanding of neuronal membrane physiology. Selected topics include biophysical models of single neurons including passive properties and action potential firing, channels regulating neuronal firing properties, synaptic interactions, and simple circuits. Cross-listed with PSYC 123L.

CBNS 133 Scientific Writing For Cell, Molecular and Developmental Biologists 4 Lecture, 3 hours; written work, 6 hours. Prerequisite(s): BIOL 102, BIOL 107A, CBNS 101, CBNS 108; a major in Cell, Molecular, and Developmental Biology; or consent of instructor. An introductory course in scientific writings. Includes preparing scientific manuscripts, research proposals, and other types of technical presentations. Satisfactory (S) or No Credit (NC) grading is not available.

CBNS 135 Educational Outreach Training in Neuroscience 4 Lecture, 10 hours per quarter; discussion, 10 hours per quarter; practicum, 20 hours per quarter; activity, 20 hours per quarter; written work, 20 hours. Prerequisite(s): CBNS 120/PSYC 120 and CBNS 124/PSYC 124 with grades of "C" or better and upper division standing in Neuroscience. Introduction to multiple approaches and activities that can be used when teaching neuroscience concepts. Builds proficiency in organizational and presentation skills, as well as provides opportunities for educational outreach. Topics include components of oral presentation, models of teaching and learning styles, and published successes in neuroscience outreach. Satisfactory (S) or No Credit (NC) grading is not available.

CBNS 150 Cancer Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BCH 110HC or BIOL 107A or CBNS 101 (may be taken concurrently with consent of instructor). Explores the origin, development, and treatment of cancer with emphasis on molecular mechanisms. Covers topics such as oncogenes, tumor suppressors, cell cycle and differentiation, AIDS, and hereditary and environmental factors in the development of cancer. Cross-listed with ENTX 150.

CBNS 165 Stem Cell Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 101 or consent of instructor. An introduction to various stem cells, their characteristics, and their niches. Explores the molecular concepts of stem cell self-renewal and tissue and organ development. Illustrates their application in therapies and explains routine methods used in stem cell biology. Reviews current governmental regulations and ethics.

CBNS 169 Human Embryology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C or consent of instructor. An in-depth study of normal human development from conception through the early postnatal period. Demonstrations use microscopic and other materials specifically adapted for the course. Some consideration is given to abnormal development.

CBNS 180 Molecular and Neural Mechanisms Underlying Natural Animal Behaviors 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 with a grade of C- or better; CBNS 124 with a grade of C- or better or PSYC 124 with a grade of C- or better; CBNS 120 or PSYC 120 is recommended; restricted to class level standing of senior; restricted to major(s) Neuroscience; or consent of instructor. A study of the molecular and neural mechanisms driving natural animal behaviors emphasizing model organism case studies and behaviors like predator-prey interactions, mating, and social dynamics. Provides insights into sensory processing, neural circuits, and genetic tools within behavioral neuroscience.

CBNS 188 Neuromodulatory Mechanisms of Behavior and Decision Making 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 with a grade of C- or better; CBNS 124 with a grade of C- or better or PSYC 124 with a grade of C- or better; CBNS 120 or PSYC 120 is recommended; restricted to class level standing of senior; restricted to major(s) Neuroscience; or consent of instructor. Discusses a series of seminal work using modern experimental and computational tools. Investigates how dopamine, acetylcholine, serotonin, noradrenaline, sex pheromones, and other neurochemicals contribute to addiction, reward, arousal, attention, anxiety, and innate behavior. Also links their modulatory effects on cellular activity to circuit functions and behavior.

CBNS 190 Special Studies 1 to 4 Individual Study, 3 to 12 hours. Prerequisite(s): upper-division standing; consent of instructor and department chair. Individual study to meet special curricular needs. Grading basis to be determined in consultation with the instructor and department chair. Course is repeatable to a maximum of 12 units.

CBNS 194 Independent Reading 1 to 2 Individual Study, 3 to 6 hours. Prerequisite(s): consent of instructor. Individual reading under faculty direction. Course is repeatable to a maximum of 4 units.

CBNS 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): either sophomore standing and one course in Cell Biology and Neuroscience or upper-division standing; consent of instructor. An introduction to laboratory research conducted under faculty supervision. Students who submit a written report or give an oral presentation receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CBNS 198I Individual Internship 1 to 12 Internship, 2 to 24 hours; written work, 1 to 12 hours. Prerequisite(s): consent of instructor. Explores career development within the context of cell, molecular, and developmental biology or health sciences. Includes supervision by an off-campus sponsor and an on-campus faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

CBNS 199 Senior Research 1 to 4 Research, 3 to 12 hours. Prerequisite(s): senior standing; consent of instructor. Original research undertaken under the direction of a faculty member. Students who submit a written report or give an oral presentation receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course repeatable.

Graduate Courses

CBNS 240 Special Topics in Scientific Rigor in Molecular, Cell and Systems Biology Research 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing; and consent of instructor. Discusses current research and publications focused on rationale, scientific premise, rigor in experimental design, and statistical methods in the area of specialization of faculty. Provides sustained discipline-specific training in hypothesis testing, critical thinking, bioethics, and professionalism. Content varies accordingly. Intended for Life Science majors. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 56 units.

MCSB 282 Current Approaches to System Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CMDB 201, may be taken concurrently; CredentialMasters; permission by faculty; graduate standing; or consent of instructor. Introduces contemporary Systems Biology focusing on disease in humans and other organisms. Covers experimental design, data analysis, and visualization. Also addresses modeling along with appropriate use of omics approaches to discern function and response to stress (including pathogenic infections).

Cell, Molecular and Behavioral Neuroscience Designated Emphasis

School of Medicine

Iryna Ethell (Biomedical Sciences), Co-Director
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Khaleel Razak (Psychology), Co-Director
khaleel@ucr.edu

Advisory Committee & Participating Faculty

Devin Binder (Biomedical Sciences)
Monica Carson (Biomedical Sciences)
Djurdjica Coss (Biomedical Sciences)
Nicholas DiPatrizio (Biomedical Sciences)
Iryna Ethell (Biomedical Sciences)
Martin Garcia-Castro (Biomedical Sciences)
David Lo (Biomedical Sciences)
Emma Wilson (Biomedical Sciences)
Seema Tiwari-Woodruff (Biomedical Sciences)
Sika Zheng (Biomedical Sciences)
Peter Hickmott (Psychology)
Kelly Huffman (Psychology)
Edward Korzus (Psychology)
Khaleel Razak (Psychology)
Michael Adams (Molecular, Cell and Systems Biology/Entomology)
Margarita Curras-Collazo (Molecular, Cell and Systems Biology)
Scott Currie (Molecular, Cell and Systems Biology)
Todd Fiacco (Molecular, Cell and Systems Biology)
Anupama Dahanukar (Molecular, Cell and Systems Biology)
Anandasankar Ray (Molecular, Cell and Systems Biology)

Designated Emphasis Requirements

The Designated Emphasis is an interdisciplinary graduate program of study to enhance student training in the field through a focused coursework across at least two departments. The program is optional and the courses used for the DE may not be counted toward MS or PhD requirements.

1. **Three (3) courses (12 units) with a focus in basic principles of cell, molecular and behavioral neuroscience will be selected from:**

   NRSC 200A Fundamentals in Neuroscience, Molecular and Cellular Mechanisms

   NRSC 200B Fundamentals in Neuroscience, Neural and Hormonal Systems

   NRSC 200C Fundamentals in Neuroscience, Neural Control of Behavior

   NRSC 201 Graduate Neuroscience Lab

   PSYC 203A Overview of Cognitive Science and Perception

   PSYC 203B Attention and Memory

   PSYC 207C Processes of Cognitive Development

   PSYC 208 Research Methods in Development

   PSYC 233 Research Methods in Cognitive Science

   CBNS 106 Introduction to Neuroscience

   CBNS 108 Introduction to Developmental Biology

   CBNS 116 Cellular Neuroscience: Structure-Function Relationship

   CBNS 120 Cellular Neuroscience: Membrane and synaptic Phenomena
   CBNS 121 Developmental Neuroscience

   CBNS 124 Systems Neuroscience

   CBNS 125 Neuropharmacology

   CBNS 126 Neuroscience of Learning and Memory

   CBNS 127 Behavioral Control Systems

   CBNS 129 Human Neuropsychology

   PSYC 112 Neural Mechanisms of Animal Behavior

   PSYC 117 Cognitive Neuroscience of Memory and Conciousness

   Students must select courses with relevant content in consultation with the Designated Emphasis Advisory Committee comprising of three participating faculty including student's major professor. Students must select courses from at least two different departments. Undergraduate course taken to fulfill the requirement must be accompanied by a 292 course taken in the same quarter with extra work agreed upon by professor and student.

2. **BMSC 222 (2 units): Special Topics in Biomedical Sciences with emphasis in neurologic diseases.** The course will address the research pertaining to the student's interest and prepare trainees in applying the knowledge of basic principles in neuroscience to the pathophysiology of neurologic disease. Graded Satisfactory (S) or No Credit (NC)

3. **Research Project: students will write a review article on a selected neuroscience topic.** The review will be evaluated by the Designated Emphasis Advisory Committee. It is the committee's expectation that student will fulfill this component by submitting the review article for the journal publication. Successful completion of this review is required for the Designated Emphasis completion.

All requirements for the Designated Emphasis must be satisfied no later than one calendar year from the quarter in which candidate advances to candidacy in their PhD field; a minimum GPA of 3.0 is required for the Designated Emphasis completion.

Cell, Molecular, and Developmental Biology

Subject abbreviation: CMDB
College of Natural and Agricultural Sciences

Ted Karginov, CMDB Lead Faculty Advisor
Program Office, 1223 Pierce Hall
(951) 827-7294
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Undergraduate Program Faculty

Professors

Michael Adams, Ph.D. (Molecular, Cell and Systems Biology/Entomology)
Peter W. Atkinson, Ph.D. (Entomology)
Julia Bailey-Serres, Ph.D. (Botany and Plant Sciences)
Meng Chen, Ph.D. (Botany and Plant Science)
Xuemei Chen, Ph.D. (Botany and Plan Sciences)
Margarita Currás-Collazo, Ph.D. (Molecular, Cell and Systems Biology)
Anupama Dahanukar, Ph.D. (Molecular, Cell and Systems Biology)
Hailing Jin, Ph.D. (Microbiology and Plant Pathology)
Howard Judelson, Ph.D. (Microbiology and Plant Pathology)
Karine G. Le Roch, Ph.D. (Molecular, Cell and Systems Biology)
Morris F. Maduro, Ph.D. (Molecular, Cell and Systems Biology)
Manuela Martins-Green, Ph.D. (Molecular, Cell and Systems Biology)
Anandasankar Ray, Ph.D. (Molecular, Cell and Systems Biology)
Venugopala Reddy Gonehal, Ph.D. (Botany and Plant Sciences)
Viji Santhakumar, Ph.D. (Molecular, Cell and Systems Biology)
Frances Sladek, Ph.D. (Molecular, Cell and Systems Biology)
Patricia S. Springer, Ph.D. (Botany and Plant Sciences)
Prudence Talbot, Ph.D. (Professor of the Graduate Division)
Linda L. Walling, Ph.D. (Botany and Plant Sciences)
Naoki Yamanaka, Ph.D. (Entomology)
Nicole zur Nieden, Ph.D. (Molecular, Cell and Systems Biology)

Associate Professors

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Todd Fiacco, Ph.D. (Molecular, Cell and Systems Biology)
Juan Pablo Giraldo, Ph.D. (Botany and Plant Science)
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Ted Karginov, Ph.D. (Molecular, Cell and Systems Biology)
Amy Litt, Ph.D. (Botany and Plant Science)
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Carolyn Rasmussen, Ph.D, (Botany and Plant Sciences)
Martin Riccomagno, Ph.D. (Molecular, Cell

and Systems Biology)
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Pooja Flora, Ph.D. (Molecular, Cell and Systems Biology)
Huimin Zhang, Ph.D. (Molecular, Cell and Systems Biology)

Associate Professor of Teaching

Scott N. Currie, Ph.D. (Molecular, Cell and Systems Biology)

Assistant Professor of Teaching

Brian Duistermars, Ph.D. (Molecular, Cell and Systems Biology)

Major

The Cell, Molecular and Developmental Biology major is designed to prepare students for diverse and exciting careers that include research, professional programs in the health sciences, and biotechnology. Course work is structured so that students first receive a solid grounding in the basic genetic and biological principles. Subsequent course requirements expand upon these themes and include courses in cell biology, molecular biology, developmental biology and genetics. Problem-based learning is employed throughout the curriculum to produce graduates with the analytical and critical thinking skills necessary to become successful researchers and professionals. After completing required core courses, students take intermediate level courses that lay the foundation for more advanced undergraduate courses. Several mechanisms exist to tailor the curriculum to the needs of the individual student, including by choosing either Disciplinary or Health Science track options.

Both the Disciplinary and Health Science tracks can lead to B.A. or B.S. degrees. They have similar major requirements, but the B.A. degree requires 12 additional units of Humanities and Social Sciences courses and 16 units in a foreign language (see College Breadth Requirements).

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Natural and Agricultural Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

Major Requirements

Some of the following requirements for the Cell, Molecular and Developmental Biology (CMDB) major may also fulfill the College's breadth requirements. Consult with an advisor for course planning.

1. **CMDB core curriculum (72-76 units)**
   a) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C
   b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC or CHEM 01HA, CHEM 01HB, CHEM 01HC, CHEM 1HLA, CHEM 1HLB, CHEM 1HLC
   c) CHEM 008A, CHEM 008B, CHEM 008C, CHEM 008LA, CHEM 008LB, CHEM 008LC, or CHEM 08HA, CHEM 08HB, CHEM 08HC, CHEM 08HLA, CHEM 08HLB, CHEM 08HLC
   d) PHYS 002A, PHYS 002B, PHYS 02LA, PHYS 02LB, PHYS 002C, PHYS 02LC, or PHYS 02HA, PHYS 02HB, PHYS 02HLA, PHYS 02HLB, PHYS 02HC, PHYS 02HLC, or PHYS 040A, PHYS 040B, PHYS 040C, or PHYS 040HA, PHYS 040HB, PHYS 040HC
   e) MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB
   f) STAT 010
   g) BCH 100, or BCH 110A and BCH 110B, or BCH 110HA and BCH 110HB

Students must complete all required core curriculum courses with a grade of C- or better and with a cumulative GPA in the courses of at least 2.0. Grades of D or F in two required courses, either separate courses or repetitions of the same course, are grounds for discontinuation from the major.

2. **Upper-division requirements (40 units)**
   a) Major core (16 units) BIOL 102, BIOL 107A or BCH 110C or BCH 110HC, CBNS 101, CBNS 108.
   b) Major electives (24 units from the following):
   Cellular emphasis. At least one of the following is required: BCH 180G; BIOL 121/MCBL 121, BIOL 128/CBNS 128; BPSC 135; CBNS 106; CBNS 120/PSYC 120; CBNS 165.

   Molecular emphasis. At least one of the following is required: BPSC 109/CBNS 109; BCH 180E; BIOL 107B; BIOL 119; BIOL124/MCBL 124; BIOL 155/BPSC 155; CBNS 150/ENTX 150.

   Developmental emphasis. At least one of the following is required: BCH 183/BPSC 183; BIOL 123/MCBL 123; BIOL 132/BPSC 132; BIOL 115; CBNS 121/PSYC 121; CBNS 169.

   Laboratory course: Two courses in a biological science are required. Courses including at least 3 hours of lab per week are eligible, including combined lecture and lab classes. Eligible classes include BIEN 155; BIOL 104/BPSC 104; BIOL 118; BIOL 121L/MCBL 121L; BIOL 132/BPSC 132; BIOL 143/BPSC 143; BIOL 161A; BIOL 171A, CBNS 120L/PSYC 120L; CBNS 130L/PSYC 123L; GNBT 114; GNBT 120; and others.

   Note: A maximum of 8 units of 190-199 courses, including no more than 4 units of 198 courses, may be counted towards the major elective requirement. A minimum of three units of BCH 197, BIOL 197, BPSC 197, CBNS 197, ENTM 197, PLPA 197, MCBL 197, NEM 197, BCH 199, BIOL 199, BPSC 199, CBNS 199, ENTM 199, PLPA 199, MCBL 199, or NEM 199 may substitute for one, but not both of the required laboratory courses.
3. ***Depth requirement (16 units).*** For B.A. students, this requirement can be fulfilled with additional courses in Humanities and Social Sciences, and Foreign Languages. For the B.S. degree, students are required to take an additional 16 units of course work in natural sciences (including a biological or chemical science) or mathematics. Additional major elective units beyond the 24 required in 2b may be applied to this requirement.
4. ***Health Science track.*** Students wishing to apply to medical, dental or veterinary professional schools must follow the requirements listed above, but are encouraged to select from the following courses. For B.A. students, some of these will fulfill their Humanities and Social Sciences and Foreign Languages requirements. Please consult the faculty adviser.
   i. Foreign language: three courses are recommended.
   ii. Community service: a maximum of 4 units may be counted towards the 180 unit graduation requirement, using CBNS 198-I or equivalent.
   iii. Ethics: A course is strongly recommended, such as PHIL 009 or PHIL 167.
   iv. Two upper-division classes in Psychology are recommended, such as CBNS 126/PSYC 126; CBNS 127/PSYC 127; PSYC 129; PSYC 178; or PSYC 179.
   v. When selecting electives in the natural sciences, students are recommended to include classes in an area of microbiology (e.g., BIOL 157, BIOL 171, ENSC 133/MCBL 133, BIOL 121/MCBL 121, BIOL 123/MCBL 123/PLPA 123, BIOL 124/MCBL 124, BIOL 134/PLPA 134), and in anatomy, zoology, or physiology (BIOL 151, BIOL 161A, BIOL 175, BIOL 176, CBNS 150/ENTX 150).



Cell, Molecular, and Developmental Biology Graduate Program

Subject abbreviation: CMDB
College of Natural and Agricultural Sciences

Michael E. Adams, Ph.D., Director
Graduate Program, 1140 Batchelor Hall
(800) 735-0717 or (951) 827-7378
cmdb.ucr.edu

Graduate Program Faculty

Professors

Michael Adams, Ph.D. (Molecular, Cell and Systems Biology)
Peter W. Atkinson, Ph.D. (Entomology)
Julia Bailey-Serres, Ph.D. (Botany and Plant Sciences)
Katherine Borkovich, Ph.D. (Microbiology and Plant Pathology)
Richard Cardullo, Ph.D. (Evolution, Ecology, and Organismal Biology)
Monica J. Carson, Ph.D. (School of Medicine)
Meng Chen, Ph.D. (Botany and Plant Science)
Xuemei Chen, Ph.D. (Botany and Plant Sciences)
Djurdjica Coss, Ph.D. (School of Medicine)
Margarita Currás-Collazo, Ph.D. (Molecular, Cell and Systems Biology)
Anupama Dahanukar, Ph.D. (Molecular, Cell and Systems Biology)
Katayoon Dehesh, Ph.D. (Botany and Plant Sciences)
Adler Dillman, Ph.D. (Nematology)
Shou-Wei Ding, Ph.D. (Microbiology and Plant Pathology)
Iryna M. Ethell, Ph.D. (School of Medicine)
Thomas Eulgem, Ph.D. (Botany and Plant Sciences)
Brian Federici, Ph.D. (Professor of the Graduate Division)
Sarjeet S. Gill, Ph.D. (Professor of the Graduate Division)
Venugopala Reddy Gonehal, Ph.D. (Botany and Plant Sciences)
Hailing Jin, Ph.D. (Microbiology and Plant Pathology)
Howard Judelson, Ph.D. (Microbiology and Plant Pathology)
Isgouhi Kaloshian, Ph.D. (Nematology)
Paul Larsen, Ph.D. (Biochemistry)
Karine G. Le Roch, Ph.D. (Molecular, Cell and Systems Biology)
Huinan Liu, Ph.D. (Bioengineering)
Xuan Liu, Ph.D. (Biochemistry)
David Lo, Ph.D., M.D. (School of Medicine)
Morris F. Maduro, Ph.D. (Molecular, Cell and Systems Biology)
Manuela Martins-Green, Ph.D. (Molecular, Cell and Systems Biology)
Ernest Martinez, Ph.D. (Biochemistry)
Ashok Mulchandani, Ph.D. (Chemical Engineering)
Jin Nam, Ph.D. (Bioengineering)
David Nelson, Ph.D. (Botany and Plant Sciences)
Michael Pirrung, Ph.D. *President's Chair* (Chemistry)
Alexander Raikhel (Entomology)
Anandasankar Ray, Ph.D. (Molecular, Cell and Systems Biology)
Viji Santhakumar, Ph.D. (Molecular, Cell and Systems Biology)
Frances Sladek, Ph.D. (Molecular, Cell and Systems Biology)
Patricia S. Springer, Ph.D. (Botany and Plant Sciences)
Prudence Talbot, Ph.D. (Professor of the Graduate Division)
Linda L. Walling, Ph.D. (Botany and Plant Sciences)
Yinsheng Wang, Ph.D. (Chemistry)
Emma Wilson, Ph.D. (School of Medicine)
Naoki Yamanaka, Ph.D. (Entomology)
Sika Zheng, Ph.D. (School of Medicine)
Changcheng Zhou, Ph.D. (School of Medicine)
Nicole zur Nieden, Ph.D. (Molecular, Cell and Systems Biology)

Associate Professors

Jeffrey B. Bachant, Ph.D. (Molecular, Cell and Systems Biology)
Jun-Hyeong Cho, Ph.D. (Molecular, Cell and Systems Biology)
Nicholas V. DiPatrizio, Ph.D. (School of Medicine)
Todd Fiacco, Ph.D. (Molecular, Cell and Systems Biology)
Juan Pablo Giraldo, Ph.D. (Botany and Plant Science)
Weifeng Gu, Ph.D. (Molecular, Cell and Systems Biology)
Sachiko Haga-Yamanaka, Ph.D. (Molecular, Cell and Systems Biology)
Rong Hai, Ph.D. (Microbiology and Plant Pathology)
Ted Karginov, Ph.D. (Molecular, Cell and Systems Biology)
Jiayu Liao, Ph.D. (Bioengineering)
Amy Litt, Ph.D.(Botany and Plant Sciences)
Kerry Mauck, Ph.D. (Entomology)
Meera Nair, Ph.D. (School of Medicine)
James Ng, Ph.D. (Plant Pathology and Microbiology)
Constance I. Nugent, Ph.D. (Molecular, Cell and Systems Biology)
Sean O'Leary, Ph.D. (Biochemistry)
Carolyn Rasmussen, Ph.D. (Botany and Plant Sciences)
Martín Riccomagno, Ph.D. (Molecular, Cell and Systems Biology)
Hongdian Yang, Ph.D. (Molecular, Cell and Systems Biology)

Assistant Professors

Garret Anderson, Ph.D. (Molecular, Cell and Systems Biology)
Bryan Brown, Ph.D. (Molecular, Cell and Systems Biology)
Sonali Chaturvedi, Ph.D. (Microbiology and Plant Pathology)
Sihem Cheloufi, Ph.D. (Biochemistry)
Juhong Chen, Ph.D. (Bioengineering)
Patrick Degnan, Ph.D. (Plant Pathology and Microbiology)
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Tara Nordgren, Ph.D. (School of Medicine)
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Megan Norris, Ph.D. (Biochemistry)
Danelle Seymour, Ph.D. (Botany and Plant Sciences)
Joy Xiang, Ph.D. (School of Medicine)
Huimin Zhang, Ph.D. (Molecular, Cell and Systems Biology)

Associate Professor of Teaching

Scott N. Currie, Ph.D. (Molecular, Cell and Systems Biology)

Assistant Professor of Teaching

Brian Duistermars, Ph.D. (Molecular, Cell and Systems Biology)

Program Overview

The Cell, Molecular, and Developmental Biology Graduate Program offers M.S. and Ph.D. degrees to students seeking advanced training in these disciplines. The program focuses on the bridge between basic and applied research and on the interface between cell, molecular, and developmental biology. Participating faculty are drawn from numerous biological sciences departments whose research interests in cell, molecular, and developmental biology span biomedical to agricultural problems, and students in the program benefit from unique training opportunities.

Students seeking admission into the program should meet all general requirements of the Graduate Division as printed in the Graduate Studies section of this catalog.

Admission

Applicants should have adequate undergraduate course work in chemistry (two years), physics (one year), calculus (one year), statistics (one course), biochemistry (one course), and biology (two years, including a course in genetics and two courses among cell, molecular, or developmental biology). Applicants with strong academic records but with deficiencies in preparation for graduate training may be admitted and must rectify undergraduate deficiencies early in the first two years of residence. Applicants may submit GRE General Test scores (verbal, quantitative and analytical) on an optional basis.

Course Work

All students must complete the following core of course work:

1. CMDB 203
2. One graduate-level course in cell biology (BIOL 200/CMDB 200, BPSC 237, or NRSC 200A/PSYC 200A)
3. One graduate-level course in molecular biology (BIOL 201/CMDB 201, BCH 211, BPSC 231/BCH 231, BMSC 202, or NRSC 200B/PSYC 200B)
4. One graduate-level course in developmental biology (BPSC 232, CMDB 202)
5. GDIV 403 Research and Scholarship Ethics (1 unit; may be taken any time prior to graduation)

Each student must enroll in the program seminars (CMDB 257, CMDB 258) each time they are offered. Upon entry into the program, each student meets with a guidance committee, which recommends a course of study commensurate with the student's interests and background.

Master's Degree

The Cell, Molecular, and Developmental Biology program offers an M.S. degree.

Plan I (Thesis)
Students complete the course work above, enroll in one graduate seminar course in cell, molecular, or developmental biology (SCH 230 (E-Z), BIOL 281 (E-Z)/CMDB 281 (E-Z), BPSC 240, BCH 289/BIOL 289/NRSC 289/PSYC 289) or other with consent of the graduate advisor, and undertake a research project leading to a thesis.

Each student must complete 36 units of course work, of which at least 24 units must be in the graduate series (200 level) in the biological sciences. No more than 12 units in courses numbered 290-299 may be taken to fulfill the 24-unit requirement. Candidates for the M.S. degree must defend their thesis at a public oral presentation.

Final Defense Modality for the M.S degree
The possible modalities are **In Person**, **Hybrid** or **Remote**. The default mode is In-Person. If Hybrid or Remote is desired, the committee chairperson, in consultation with the student, will determine the modality for the final defense, with the approval of the Graduate Advisor or Program Director.

Students presenting a final defense **in person** are expected to present on campus with all committee members physically present.

Students presenting a final defense **hybrid,** have the option for some committee members/students to attend in-person and some committee members/students to attend remotely.

Students presenting a final defense **remotely**; all participants, students, and committee members can participate remotely.

Normative Time to Degree Two years

Doctoral Degree

The Cell, Molecular, and Developmental Biology program offers a Ph.D. degree.

Degree Requirements

1. Completion of the course work listed above
2. One additional graduate course in cell, molecular, and developmental biology
3. One graduate seminar course in cell, molecular, or developmental biology (BCH 230 (E-Z), BIOL 281 (E-Z)/CMDB 281 (EZ), BPSC 240, BCH 289/BIOL 289/CHEM 289/ ENTM 289/NRSC 289/PSYC 289} or other with consent of the graduate advisor
4. A research project leading to a dissertation
5. Oral public defense of dissertation

Written and Oral Qualifying Examinations
Doctoral students are advanced to candidacy following successful completion of written and oral qualifying examinations. Students write a proposal detailing the rationale, specific aims, and approaches to be undertaken for their proposed dissertation research prior to taking the oral qualifying examination.

Professional Development Training
Ph.D. graduate students fulfill their professional development training requirement through the following activities:

1) **Responsible conduction of research:** One-time mandatory enrollment in GDIV 403 *Research and Scholarship Ethics* (1 unit; may be taken any time prior to graduation).
2) **Teaching:** One-time mandatory orientation in the Teaching Assistant Development Program administered through Graduate Division (must be fulfilled prior to classroom instruction). CMDB requires two quarters of TA teaching.
3) **Safety training:** Mandatory laboratory safety training administered through Environmental Health and Safety. Additional training may be mandated for some research activities.
4) **Presentations, scientific interactions and intellectual development:** Enrollment each quarter in CMDB 257 Seminar in Cell, Molecular and Developmental Biology. Part of the professional development in this course involves luncheon meetings between the speakers and students following the seminar. CMDB also offers opportunities for participation and presentation in intra-mural research seminars.
5) **Research Training:** Individual research training in major professor laboratories is associated with enrollment in CMDB 250, which encompasses laboratory journal clubs and lab meetings, as well as CMDB 297 and CMDB 299 research units. Students are also required to schedule an Annual Research Progress Evaluation (ARPE) with their guidance or dissertation committee to monitor ongoing professional development.

Dissertation
Candidates must successfully defend their dissertation research in a public oral presentation.

Oral Qualifying Exam and Final Defense Modality for the Ph.D. degree
The possible modalities are **In Person**, **Hybrid** or **Remote**. The default mode is In-Person. The Hybrid and Remote options can be considered if the student or faculty member cannot attend in person due to travel or health reasons. If Hybrid or Remote is desired, the committee chairperson, in consultation with the student, will determine the modality for the Oral Qualifying Exam or Thesis Defense, with the approval of the Graduate Advisor or Program Director.

Students taking the oral qualifying exam/ presenting a final defense **in person** are expected to present on campus with all committee members physically present.

Students taking the oral qualifying exam/ presenting a final defense **hybrid**, have the option for some committee members/students to attend in-person and some committee members/students to attend remotely.

Students taking the oral qualifying exam/ presenting a final defense **remotely**; all participants, students, and committee members can participate remotely.

Teaching Requirement
Students must fulfill a two-quarter teaching requirement.

Career Opportunities

There is a high demand in industry and academia for scientists with training in cell, molecular, and developmental biology. Students matriculating from the program are well trained in this field and successfully obtain positions in biotechnology, including biomedical and agricultural industries, and at colleges and universities nationwide.

Normative Time to Degree Five years

Graduate Courses

CMDB 200 Cell Biology 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently); BIOL 102 or equivalent; BIOL 113 or BIOL 114 or CBNS 101 or equivalent; graduate standing. An examination of the structure and function of eukaryotic cells and their components with emphasis on the key experiments that provide the foundation for our current knowledge. Covers topics such as cell membranes, intracellular trafficking, cell-to-cell interactions, motility, and the cytoskeleton. Cross-listed with BIOL 200.

CMDB 201 Molecular Biology 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently); BIOL 102 or equivalent; BIOL 107A or equivalent; graduate standing. Covers the structure and inheritance of genetic material, the regulation of gene expression at the cellular and molecular level including molecular mechanisms for regulation of gene transcription, posttranscriptional regulation at the level of messenger RNA stability, processing, editing and translation, methods for gene mapping, and positional cloning. Cross-listed with BIOL 201.

CMDB 202 Developmental Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 101 or equivalent; graduate standing. An examination of development, beginning with the principles that underlie developmental studies of all multicellular organisms. Focuses on plants, insects, and fungi but introduces other model systems. Topics are taken from the current literature.

CMDB 203 Advanced Genetic Analysis in Model Organisms 4 Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): BIOL 102 or equivalent; graduate standing or consent of instructor. Examines essential concepts in modern genetics. Focuses on universal principles of genetic analysis in prokaryotic and eukaryotic model organisms, emphasizing underlying concepts and logic. Develops skills reading primary scientific literature and critical thinking through analysis of landmark papers. Cross-listed with GEN 203.

CMDB 204 Genome Maintenance and Stability 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BCH 110HC or BIOL 107A; BIOL 113 or BIOL 114 or CBNS 101; BIOL 102 is strongly recommended; graduate standing. Emphasizes chromosome-based processes that maintain genome integrity and ensure accurate genome transmission during cell division. Topics are drawn from

the primary literature and include chromatin structure and composition, DNA repair and recombination, telomere function and chromosome maintenance, mitotic chromosome segregation, and checkpoint surveillance mechanisms. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with BCH 204, and ENTX 204.

CMDB 206 Gene Silencing 3 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing, BIOL 107A or CBNS 101; or consent of instructor. An in-depth coverage of mechanisms, functions, and applications of RNAi and related gene regulatory pathways guided by small RNAs such as siRNAs and miRNAs in plants and animals. Cross-listed with GEN 206, and MCBL 206.

CMDB 207 Stem Cell Biology and Disease 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduces animal and human stem cell biology and the application of stem cell biology to medicine.

CMDB 208 Stem Cell Ethics 2 Seminar, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces stem cell ethics emphasizing moral, legal, and social issues in stem cell research.

CMDB 209 Ribonucleic Acid (rna) Biology 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BIOL 107A or CBNS 101 or equivalent; graduate standing; or consent of instructor. A comprehensive overview of the multiple functions of ribonucleic acid (RNA) in the cell. Topics include mRNA, rRNA, and tRNA function and metabolism; RNA catalysis and the "RNA world"; eukaryotic and bacterial non-coding RNAs; and bacterial riboswitches. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with BCH 209, and GEN 209.

CMDB 210 Molecular Biology of Human Disease Vectors 3 Lecture, 2 hours; seminar, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Covers the molecular aspects of vectors transmitting most dangerous human diseases. Involves lectures and student presentations about current issues in molecular biology and genomics of vector insects and pathogens they transmit. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with ENTM 210, and MCBL 210.

CMDB 211 Laboratory in Human Embryonic Stem Cell Culture 2 Lecture, 5 hours per quarter, laboratory, 40 hours per quarter, workshop, 5 hours per quarter. Prerequisite(s): graduate standing; and consent of instructor. Introduces the methods used to culture human embryonic stem cells (hESC) in vitro. Provides hands-on experience in plating, passaging, culturing, differentiating, and freezing of hESC. Additional topics include staining colonies of hESC for pluripotency markers (including alkaline phosphatase); labeling colonies using immunohistochemistry; and performing chromosome squashes for evaluation of aneuploidy. Graded Satisfactory (S) or No Credit (NC).

CMDB 230 Molecular Plant-Microbial Interactions 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 120 or MCBL 120 or PLPA 120, or equivalents; graduate standing. A study of the physiology of host-pathogen interactions with emphasis on the metabolism of diseased plants, nature of pathogenicity, and defense mechanisms in plants. Cross-listed with PLPA 230, BPSC 230, and GEN 230.

CMDB 250 Special Topics in Cell, Molecular, and Developmental Biology 1 to 2 Seminar, 1 to 2 hours. Prerequisite(s): graduate standing. Oral presentations and intensive small-group discussion of selected topics in the area of special competence of each participant. Content emphasizes recent advances in the topic area and varies accordingly. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CMDB 255 Stem Cell Biology 1 Discussion, 10 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. Presents research data to an interdisciplinary group of stem cell biologists. Covers presentation skills and answering questions about research data. Fosters discussion of stem cell biology. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CMDB 256 Seminar in Stem Cell Biology 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Provides opportunities to meet stem cell researchers from other campuses and learn about the latest developments in animal and human stem cell research. Includes investigators who focus on the potential application of stem cells to medicine. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CMDB 257 Seminar in Cell, Molecular, and Developmental Biology 1 Seminar, 1 hour. Prerequisite(s): graduate standing. Presentations by visiting scholars, CMDB faculty, and CMDB students on current research in cell, molecular, and developmental biology. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 30 units.

CMDB 258 Graduate Student Seminar in Cell, Molecular, and Developmental Biology 1 Seminar, 10 hours per quarter; one 1-day seminar, Prerequisite(s): graduate standing in Cell, Molecular, and Developmental Biology. An interdisciplinary seminar consisting of student presentations of original research and discussion of current research topics in cell, molecular, and developmental biology. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 30 units.

CMDB 281 (E-Z) Seminar in Cell Development, Structure, and Function 2 Seminar, 2 hours. Prerequisite(s): graduate standing. Lectures, discussions, and demonstrations by students, faculty, and invited scholars on selected subjects concerned with the principles of cell development, structure, and function. E. Cell Biology; F. Molecular Biology; G. Developmental Biology. Course is repeatable to a maximum of units. Cross-listed with BIOL 281 (E-Z).

CMDB 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual study, directed by a faculty member, of specially selected topics in cell, molecular, and developmental biology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CMDB 292 Concurrent Analytical Studies in Cell, Molecular, and Developmental Biology 2 to 4 Research, 6 to 12 hours. Prerequisite(s): graduate standing. Elected concurrently with an appropriate undergraduate course, but on an individual basis. Students are required to submit one or more graduate papers based on research or criticism related to the course. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CMDB 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing. Research and experimental studies conducted under the supervision of a faculty member on specially selected topics in cell, molecular, and developmental biology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CMDB 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Course

CMDB 301 Teaching of Cell, Molecular, and Developmental Biology at the College Level 1 Seminar, 1 hour. Prerequisite(s): graduate standing .A program of weekly meetings and individual formative evaluations required of new teaching assistants. Covers instructional methods and classroom/section activities most suitable for teaching Biology. Conducted by the Teaching Assistant Development Program. Graded Satisfactory (S) or No Credit (NC).

CHASS F1RST

Subject abbreviation: CHFY
College of Humanities, Arts, and Social Sciences

Dr. Christina Rogers, Director and Instructor
Dr. Shellee Stewart, Assistant Director
1614 Humanities and Social Sciences
(951) 827-2742; chassf1rst.ucr.edu

CHASS F1RST provides first-year students with courses designed to help with the transition to UCR, a major research university setting, which involves high academic standards and rigorous course work. The courses offer students the resources and tools necessary to excel in the first year and beyond. They take place within a "learning-communities" framework so that students can successfully integrate into campus life.

Lower-Division Courses

CHFY 001 (E-Z) Chass F1rst Humanities Course 4 Lecture, 3 hours. Prerequisite(s): restricted to class level standing of freshman, or sophomore. A College of Humanities, Arts, and Social Sciences course designed to introduce students to the humanities and to academic life. Segments of CHFY 001 (E-Z), CHFY 002 (E-Z), and/or CHFY 003 (E-Z) may be thematically and pedagogically linked.

CHFY 001E Chass F1rst Humanities Course: Literature 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A literature course thematically and pedagogically linked to another CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or a CHFY 003 (E-Z) segment. Topics vary.

CHFY 001F Chass F1rst Humanities Course: Religious Studies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A religious studies course thematically and pedagogically linked to another CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or a CHFY 003 (E-Z) segment. Topics vary.

CHFY 001I Chass F1rst Humanities Course: History 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A history course thematically and pedagogically linked to another CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or a CHFY 003 (E-Z) segment. Topics vary.

CHFY 001J Chass F1rst Humanities Course: Comparative Literature 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A comparative literature course thematically and pedagogically linked to another CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or a CHFY 003 (E-Z) segment. Topics vary.

CHFY 001K Chass F1rst Humanities Course: Hispanic Studies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A hispanic studies course thematically and pedagogically linked to another CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or a CHFY 003 (E-Z) segment. Topics vary.

CHFY 001M Chass F1rst Humanities Course: Philosophy 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A philosophy course thematically and pedagogically linked to another CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or a CHFY 003 (E-Z) segment. Topics vary.

CHFY 002 (E-Z) Chass F1rst Fine Arts Course 4 Lecture, 3 hours. Prerequisite(s): restricted to class level standing of freshman, or sophomore. A College of Humanities, Arts, and Social Sciences course designed to introduce students to the fine arts and to academic life. Segments of CHFY 001 (E-Z), CHFY 002 (E-Z), and/or CHFY 003 (E-Z) may be thematically and pedagogically linked.

CHFY 002E Chass F1rst Fine Arts Course: Theatre, Film, and Digital Production 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A theatre course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, another CHFY 002 (E-Z) segment, and/or a CHFY 003 (E-Z) segment. Topics vary.

CHFY 002F Chass F1rst Fine Arts Course: Music 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A music course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, another CHFY 002 (E-Z) segment, and/or a CHFY 003 (E-Z) segment. Topics vary.

CHFY 002G Chass F1rst Fine Arts Course: Media and Cultural Studies 4 Lecture, 3 hours; discussion, 1 hour; screening, 3 hours. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A film and visual culture course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, another CHFY 002 (E-Z) segment, and/or a CHFY 003 (E-Z) segment. Topics vary.

CHFY 002I Chass F1rst Fine Arts Course: Dance 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A dance course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, another CHFY 002 (E-Z) segment, and/or a CHFY 003 (E-Z) segment. Topics vary.

CHFY 002J Chass F1rst Fine Arts Course: Art History 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. An art history course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, another CHFY 002 (E-Z) segment, and/or a CHFY 003 (E-Z) segment. Topics vary.

CHFY 002K Chass F1rst Fine Arts Course: Creative Writing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A creative writing course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, another CHFY 002 (E-Z) segment, and/or a CHFY 003 (E-Z) segment. Topics vary.

CHFY 003 (E-Z) Chass F1rst Social Science Course 4 Lecture, 3 hours. Prerequisite(s): restricted to class level standing of freshman, or sophomore. A College of Humanities, Arts, and Social Sciences course designed to introduce students to the social sciences and to academic life. Segments of CHFY 001 (E-Z), CHFY 002 (E-Z), and/or CHFY 003 (E-Z) may be thematically and pedagogically linked.

CHFY 003E Chass F1rst Social Science Course: Anthropology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. An anthropology course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or another CHFY 003 (E-Z) segment. Topics vary.

CHFY 003F Chass F1rst Social Science Course: Economics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. An economics course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or another CHFY 003 (E-Z) segment. Topics vary.

CHFY 003G Chass F1rst Social Science Course: Political Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A political science course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or another CHFY 003 (E-Z) segment. Topics vary.

CHFY 003I Chass F1rst Social Science Course: Sociology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A sociology course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or another CHFY 003 (E-Z) segment. Topics vary.

CHFY 003J Chass F1rst Social Science Course: Psychology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A psychology course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or another CHFY 003 (E-Z) segment. Topics vary.

CHFY 003K Chass F1rst Social Science Course: Gender and Sexuality Studies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. A women's studies course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or another CHFY 003 (E-Z) segment. Topics vary.

CHFY 003M Chass F1rst Social Science Course: Ethnic Studies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):freshman or sophomore standing in the College of Humanities, Arts, and Social Sciences. An ethnic studies course thematically and pedagogically linked to a CHFY 001 (E-Z) segment, a CHFY 002 (E-Z) segment, and/or another CHFY 003 (E-Z) segment. Topics vary.

CHFY 004 Educational Leadership 2 Lecture, 1 hour; extra reading, 1.5 hours; individual study, 1.5 hours. Prerequisite(s): recommended for CHASS students. An introduction to the Educational Leadership seminar to develop personal, academic, and professional development skills that can enhance students learning on scholarships and internship opportunities. Graded Satisfactory (S) or No Credit (NC).

CHFY 007 Chass F1rst Learning Community Workshop 2 Workshop, 3 hours. Prerequisite(s): restricted to College of Humanities, Arts, and Social Sciences; restricted to class level standing of freshman, or sophomore. A workshop linked to a CHASS F1RST Learning Community lecture course. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

CHFY 010 Step-By-Step to College Success For First Year Transfer Students 2 Lecture, 1 hour; extra reading, 1.5 hours; individual study, 1.5 hours. Prerequisite(s): restricted to class level standing of junior. Explores the factors relating to academic success. Addresses the social and psychological adjustment to college life. Investigates a wide range of academic disciplines and campus student support services. Offered online only. Graded Satisfactory (S) or No Credit (NC).

CHFY 020 Theory and Practice of Peer Instruction 4 Seminar, 4 hours. Prerequisite(s): consent of the CHASS F1RST Academic Advisor. An intensive examination of study development theory, retention models, and pedagogy related to peer-to-peer instruction.

Upper-Division Courses

CHFY 198I Chass F1rst Individual Internship 1 to 4 Consultation, .5 to 2 hours; internship, 3 to 12 hours; written work, 1 to 4 hours. Prerequisite(s): approval of the CHASS F1RST Academic Coordinator Provides on-campus opportunities in the CHASS F1RST office to acquire skills and experience for future endeavors. Course is repeatable to a maximum of 8 units.

Chemical and Environmental Engineering

Subject abbreviations: CEE, CHE, ENVE
The Marlan and Rosemary Bourns College of Engineering

David Cocker, Ph.D., Chair
Department Office, A220 Bourns Hall
(951) 827-2423; https://www.cee.ucr.edu/

Professors
David Cocker, Ph.D., Chair in Chemical and Environmental Engineering
Don Collins, Ph.D.
Juchen Guo, Ph,D.
Georgios Karavalakis, Ph.D.
Haizhou Liu, Ph.D.
Ashok K. Mulchandani, Ph.D., *Distinguished Professor*
Markus Peters, Ph.D.
Ian Wheeldon, Ph.D.
Bryan Wong, Ph.D.
Jianzhong Wu, Ph.D.
Michael Zachariah, Ph.D., *Distinguished Professor*

Associate Professors
Robert Jinkerson, Ph.D.
Fudong Liu, Ph.D.
Jinyong Liu, Ph.D.
Yujie Men, Ph.D.
Younjin Min, Ph.D.
Ruoxue Yan, Ph.D.

Assistant Professor
Ke Du, Ph.D.

Assistant Professors of Teaching
Amanda Rupiper, Ph.D.
Jiamin Zhang, Ph.D.

**

Adjunct Professor
Abhilash Vijayan, Ph.D.

Adjunct Associate Professors
Kelley Barsanti Ph.D.
Yanran Li, Ph.D.

Adjunct Assistant Professors
Leslie Abdul-Aziz Ph.D.
Cesunica Ivey Ph.D.
Sarah Petters Ph.D.

Cooperating Faculty
Roya Bahreini, Ph.D. (Environmental Sciences)
Lorenzo Mangolini, Ph.D.
Joshua Morgan, Ph.D.

Majors

The Department of Chemical and Environmental Engineering offers B.S. degrees in Chemical Engineering and in Environmental Engineering, and M.S. and Ph.D. degrees in Chemical and Environmental Engineering. For more details, see https://www.cee.ucr.edu/.

Chemical Engineering focuses on transforming raw materials into useful everyday products. Chemical engineers turn the discoveries of chemists and physicists into commercial realities. They find work in a variety of fields including pharmaceuticals, materials, chemical, fuels, pollution control, medicine, and nuclear and electronic industries. At UCR, the B.S. degree in Chemical Engineering offers students three options: Biochemical Engineering, focusing on biochemical processes; Nanotechnology, focusing on nanoscale processes; or Chemical Engineering, emphasizing traditional chemical engineering issues.

The program's educational objectives are to produce graduates who attain high levels of technical expertise to enable their achievement in diverse chemical engineering practice and research, or in allied careers, prepare them for graduate level education, and enable them to be successful members of the professional community, for the benefit of our constituents.

The Bachelor of Science in Chemical Engineering (CHE) Program is accredited by the Engineering Accreditation Commission (EAC) of ABET, abet.org, under the commission's General Criteria and Program Criteria for Chemical, Biochemical, Biomolecular, and Similarly Named Engineering Programs. For additional details, see https://www.cee.ucr.edu/abet/.

Environmental Engineering deals with design and construction of processes and equipment intended to lessen the impact of man's activities on the environment. With the growing importance of environmental quality, the environmental engineer plays a pivotal role in modern industrial activity. Environmental engineers are involved in a wide range of activities including the design of alternative fueled vehicles, the development of renewable energy sources, the design of equipment for solid waste collection and disposal, municipal and industrial wastewater treatment, air pollution control systems, and hazardous waste management.

The program's educational objectives are to produce graduates who attain high levels of technical expertise to enable their achievement in diverse environmental engineering practice and research, or in allied careers, prepare them for graduate level education, and enable them to be successful members of the professional community, for the benefit of our constituents.

The Bachelor of Science in Environmental Engineering (ENVE) Program is accredited by the Engineering Accreditation Commission (EAC) of ABET, abet.org, under the commission's General Criteria and Program Criteria for Environmental Engineering and Similarly Named Engineering Programs. For additional details, see https://www.cee.ucr.edu/abet#environmentalengineering/.

All undergraduates in the College of Engineering must see an advisor at least annually. Visit student.engr.ucr.edu for details.

Change of Major Criteria

All students who request a change of major to Chemical Engineering must meet the following requirements:

- Be in good academic standing
- Have no less than a C- in any Math, Science and Engineering coursework
- Have a minimum 2.0 GPA in all Math, Science and Engineering required coursework
- Be able to complete major within maximum allowable units
- Complete all the courses listed below, based on the total number of units earned, prior to submitting the major change request
- UCR transfer students interested in changing to a BCOE major must have been admissible to the major at point of entry, or must satisfy transfer admission and change of major requirements before earning 120 units
- If changing in the 90-119 units category student must have the ability to complete major within 5 years of entry as a Freshmen or 3 years after entry as a Transfer student
- Students who have earned 120 or more units are not eligible for a change of major in BCOE. *NOTE*: AP/IB units are excluded from maximum unit calculation

Completed 0 to less than 45 units
Completion of ENGL 001A with C or better andcompletion of the following with at least 2.500 GPA:

- CHEM 001A or CHEM 01HA
- CHEM 01LA or CHEM 01HLA
- MATH 009A or MATH 09HA
- PHYS 040A or PHYS 040HA

Completed 45 to less than 90 units
Completion of ENGL 001A with C or better and completion of the following with at least 2.500 GPA:

- CHEM 001A or CHEM 01HA
- CHEM 01LA or CHEM 01HLA
- CHEM 001B or CHEM 01HB
- CHEM 01LB or CHEM 01HLB
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A or PHYS 040HA

Completed 90 to less than 120 units
Completion of ENGL 001A and ENGL 001B with C or better and completion of the following with at least 2.500 GPA:

- CHEM 001A or CHEM 01HA
- CHEM 01LA or CHEM 01HLA
- CHEM 001B or CHEM 01HB
- CHEM 01LB or CHEM 01HLB
- CHEM 001C or CHEM 01HC
- CHEM 01LC or CHEM 01HLC
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A or PHYS 040HA
- PHYS 040B or PHYS 040HB

Change of Major Criteria

All students who request a change of major to Environmental Engineering must meet the following requirements:

- Be in good academic standing
- Have no less than a C- in any Math, Science and Engineering coursework
- Have a minimum 2.0 GPA in all Math, Science and Engineering required coursework
- Be able to complete major within maximum allowable units
- Complete all the courses listed below, based on the total number of units earned, prior to submitting the major change request
- UCR transfer students interested in changing to a BCOE major must have been admissible to the major at point of entry, or must satisfy transfer admission and change of major requirements before earning 120 units
- If changing in the 90-119 units category student must have the ability to complete major within 5 years of entry as a Freshmen or 3 years after entry as a Transfer student
- Students who have earned 120 or more units are not eligible for a change of major in BCOE. *NOTE*: AP/IB units are excluded from maximum unit calculation

Completed 0 to less than 45 units Completion of ENGL 001A with C or better and completion of the following with at least 2.500 GPA:

- CHEM 001A or CHEM 01HA
- CHEM 01LA or CHEM 01LHA
- MATH 009A or MATH 09HA
- PHYS 040A or PHYS 040HA

Completed 45 to less than 90 units
Completion of ENGL 001A with C or better and completion of the following with at least 2.500 GPA:

- CHEM 001A or CHEM 01HA
- CHEM 01LA or CHEM 01HLA
- CHEM 001Bor CHEM 01HB
- CHEM 01LB or CHEM 01HLB
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A or PHYS 040HA
- C or better ENGL 1A

Completed 90 to less than 120 units
Completion of ENGL 001A and ENGL 001B with C or better and completion of the following with at least 2.500 GPA:

- CHEM 001A or CHEM 01HA
- CHEM 01LA or CHEM 01HLA
- CHEM 001B or CHEM 01HB
- CHEM 01LB or CHEM 01HLB
- CHEM 001C or CHEM 01HC
- CHEM 01LC or CHEM 01HLC
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A or PHYS 040HA
- PHYS 040B or PHYS 040HB

University Requirements

See Undergraduate Studies section.

College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Chemical Engineering major and the Environmental Engineering major use the following major requirements to satisfy the college's Natural Sciences and Mathematics breadth requirement.

1. BIOL 005A, BIOL 05LA
2. CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
3. MATH 008B or MATH 009A

Major Requirements

Chemical Engineering

Students must choose either a Biochemical Engineering, Chemical Engineering or Nanotechnology option.

1. **Lower-division requirements (76 units)**
   a) BIOL 005A, BIOL 05LA
   b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC, CHEM 008A, CHEM 008B, CHEM 008C, CHEM 08LA, CHEM 08LB, CHEM 08LC
   c) CS 009P
   d) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
   e) PHYS 040A, PHYS 040B, PHYS 040C
   f) CEE 010
2. **Upper-division requirements (63 units)**
   a) CEE 158
   b) CHE 100, CHE 110A, CHE 110B, CHE 114, CHE 116, CHE 117, CHE 118, CHE 120, CHE 122, CHE 160B, CHE 160C, CHE 175A, CHE 175B
   c) CHE 130/ENVE 130, CHE 160A/ENVE 160A
   d) ENGR 118
3. **Option requirements: choose one option**
   a) **Biochemical Engineering option (18 units)**
      (1) BCH110A/BCH 100
      (2) CHE 124, CHE 124L, CHE140
      (3) Four (4) units of technical electives chosen from BIEN 125, BIEN 140A/CEE 140A, BIEN 159/CEE 159, BIOL 121/MCBL 121, CEE 125, CEE 132, CEE 135, CHE 102, CHE 150
   b) **Chemical Engineering option (16 units)**
      (1) Sixteen (16) units of technical electives chosen from CEE 125 or CEE 135, CEE 132, CHE 102, CHE 131, CHE 136, CHE 171, ENVE 120, ENVE 133, ENVE 134, ENVE 138
   c) **Nanotechnology option (19 units)**
      (1) CHE 105
      (2) CHE 161

(3) CEE 135

(4) Eight (8) units of technical electives chosen from CHE 102, CHE 131, ENVE 133, ME 114, MSE 160, MSE 161

Visit the Student Affairs Office in the College of Engineering or **student.engr.ucr.edu** for a sample program.

Environmental Engineering

1. **Lower-division requirements (76 units)**
   a) BIOL 005A, BIOL 05LA
   b) CEE 010
   c) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC, CHEM 008A, CHEM 008B, CHEM 08LA, CHEM 08LB
   d) CS 009P
   e) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
   f) ME 010
   g) PHYS 040A, PHYS 040B, PHYS 040C
2. **Upper-division requirements (85 units)**
   a) CEE 158
   b) CHE 100, CHE 114, CHE 120
   c) ENGR 118
   d) ENSC 100/SWSC 100
   e) ENVE 120, ENVE 133, ENVE 135, ENVE 142, ENVE 146, ENVE 160B, ENVE 160C, ENVE 171, ENVE 175A, ENVE 175B
   f) ENVE 130/CHE 130, ENVE 160A/CHE 160A
   g) ENVE 121, ENVE 134, ENVE 140
   h) Choose one from CHE 102, CHE 116, CHE 124, CEE 125, CEE 132, ENVE 138, ENVE/ENSC 144, ENVE 145, ENSC/ENTX/CHEM 135, ENSC 136, ENSC 163, 4 units of HNPG 199H

Visit the Student Affairs Office in the College of Engineering or **student.engr.ucr.edu** for a sample program.

Graduate Program

The Graduate Program in Chemical and Environmental Engineering offers training leading to the degrees of M.S. and Ph.D. in Chemical and Environmental Engineering. Fields of specialization include biochemical engineering and bioengineering, environmental biotechnology, air quality systems engineering, water quality systems engineering, thermodynamics, advanced materials, and nanotechnology.

Combined B.S. + M.S. Five-Year Program
The college offers combined B.S.+ M.S. programs in both Chemical Engineering and Environmental Engineering designed to lead to a Bachelor of Science degree as well as a Master of Science degree in five years. Applicants for this program must have a high school GPA above 3.6, a combined SAT Reasoning score above 1950 (or ACT plus Writing equivalent), complete the Entry Level Writing Requirement before matriculation, and have sufficient mathematics preparation to enroll in calculus in their first quarter as freshmen.

Interested students who are entering their junior year should check with their academic advisor for information on eligibility and other details.

Admission
Applicants should have a degree in chemical and environmental engineering or closely related fields, have a satisfactory overall GPA from their undergraduate studies, and good letters of recommendation. Normally, students admitted to regular standing have satisfied all prerequisite course work. Under special circumstances, students who have not completed all undergraduate requirements may be admitted provided that the deficiencies are corrected to the satisfaction of the student's advisory committee within the first year of graduate study. Courses taken for this purpose do not count towards an advanced degree. International students, permanent residents, and even U.S. citizens whose native language is not English and who do not have a bachelor's or postgraduate degree from an institution where English is the exclusive language of instruction must complete the Test of English as a Foreign Language (TOEFL) with a minimum score of 550 (paper-based test), 213 (computer-based), or 80 (internet-based).

Course Work
To ensure that advanced degree recipients in the graduate program have advanced knowledge in mathematics and chemical engineering principles that form the foundation for chemical and environmental engineering, a core course program has been implemented. All M.S. and Ph.D. students must participate in the core course program. Students who have completed these (or equivalent) courses elsewhere may petition to have the core course requirement waived or some of their units transferred (see the Graduate Division policy for transferring course units). Competency in these areas will be tested as part of the comprehensive exam for M.S. students and in the written preliminary examination for Ph.D. students. The current core courses are as follows:

CEE 200 (Advanced Engineering Computations)

CEE 202 (Transport Phenomena)

CEE 204 (Advanced Kinetics and Reaction Engineering)

CEE 206 (Advanced Chemical Engineering Thermodynamics)

Academic Appeals Process
Policies and procedures relating to Academic Appeals can be found through the UCR Graduate Division link, **https://graduate.ucr.edu/regulations-and-procedures/**.

Incoming students without a B.S. degree in chemical or environmental engineering must demonstrate competency in these areas either by taking the appropriate undergraduate courses and/or by passing the written preliminary exam. At UCR, the required courses are CHE 100, CHE 110A, CHE 110B, ENVE 171, CHE 114, CHE 116, CHE 120, CHE 130, and ENGR 118. Students may also be required to take some of the above courses to satisfy the prerequisites of the core graduate courses.

Each quarter, all M.S. and Ph.D. students in residence must enroll in CEE 286 (Colloquium in Chemical and Environmental Engineering). In addition, all M.S. and Ph.D. students must participate each year in the CEE Graduate Student Symposium, usually held just before the beginning of the fall quarter.

Professional Development Training

1. Two sessions of CEE 286 each quarter will be dedicated to professional development. The subjects will include but are not limited to: research ethics, scientific and technical writing, academic careers, employment opportunities beyond academia, and professional networking.
2. A weekly one hour networking meeting with a visiting colloquia speaker.
3. Fall quarter fellowship/grant writing workshops. Focus will be on incoming domestic students applying for NSF graduate fellowships.

Master's Degree

The Department of Chemical and Environmental Engineering offers the M.S. degree in Chemical and Environmental Engineering.

Plan I (Thesis) requires completion of a minimum of 36 units of approved course work including the core courses and submission of an acceptable M.S. thesis. At least 24 of these units must be in regular lecture graduate courses (200 series courses). No more than 4 units of CEE 290 or CEE 297 combined and 6 units of CEE 286 or special topics courses (CEE 250 or CEE 260 series) may apply towards the 36 units.

Plan II (Comprehensive Examination) requires completion of a minimum of 36 units of approved course work including the core courses and successful passage of a comprehensive examination. At least 28 of these units must be in regular lecture graduate courses (200-series courses), and none may be in courses numbered CEE 286, CEE 290, CEE 297, CEE 299, or CEE 302.

Examination – The exam consists of three written tests in three different areas emphasizing graduate level fundamental knowledge and breadth of the study area rather than specifics covered in individual courses. Exams areas can include, but are not limited to:

1. Advanced Air Pollution Control and Engineering
2. Advanced Chemical Engineering Thermodynamics
3. Advanced Kinetics and Reaction Engineering
4. Physical and Chemical Separation Processes
5. Transport Phenomena

An oral follow-up session may be requested by the examination committee following its evaluation of the written exam. No more than two attempts to pass the exam are allowed. Students who fail the exam once and then want to switch to the thesis plan should contact the graduate advisor. Students who fail the exam twice may not switch to the thesis plan.

The Comprehensive Exam is only offered once an academic year during the Spring quarter. Students should state intent to take the exam by week 10 of Winter quarter.

Plan II (Comprehensive Examination, Industrial Biotechnology concentration) requires completion of a minimum of 36 units of approved course work including the industrial biotechnology related courses CHE 124, CHE 124L, CEE 210, CEE 211, CEE 212, CEE 236, CEE 238A, CEE 238B, CEE 238C, CEE 248, and CEE 298-I. A minimum of 2 units of CEE 298-I is required. Students who elect the Industrial Biotechnology track must complete an industry-based research project with accompanying written report. This project serves in lieu of a comprehensive final examination. Students whose project and report are deemed "not acceptable" are given one additional quarter to revise them to an "acceptable" level.

Plan II (Comprehensive Examination, Air Quality Engineering concentration) requires completion of a minimum of 36 units of approved course work including:

Required core courses (16 units)
CEE 207, CEE 233, CEE 234, CEE 236

Electives selected from the following list (16 units)
CEE 200, CEE 202, CEE 204, CEE 206, CEE 220, CEE 125[1], CEE 136[1], ENVE 133[1], ENVE 134[1], ENVE 135[1], ENVE 138[1], ENSC 227[2], ENSC 245[2], ME 248[2], PBPL 233[2], ENSC 135[1, 2], ME 117[1, 2], ME 136[1, 2]

Required internship course (4 units)
CEE 298i

A minimum of 4 units of CEE 298i is required. Students who elect the Air Quality Engineering track must complete an internship and research project with accompanying written report. This project serves in lieu of a comprehensive final examination. Students whose project and report are deemed "not acceptable" are given one additional quarter to revise them to an "acceptable" level.

[1] Credit awarded for no more than 8 units of undergraduate courses

[2] Credit awarded for no more than 8 units of out of department courses

Substitutions or other alterations to the overall course requirements require approval from the Chemical and Environmental Engineering Graduate Advisor. Other courses may be substituted but must be approved by the Chemical and Environmental Engineering Graduate Advisor. Additional courses may be required by the Advisory Committee depending on the student's background and fields of interest.

For the M.S. degree, students must complete a minimum of three quarters in residence in the UC with a GPA of 3.00 or better in all 100- and 200-level course work related to the degree.

Thesis Committee
The committee consists of three members. The student and advisor nominate the committee before the end of the first year with the concurrence of the graduate committee. After review of the nominations, the dean of the Graduate Division appoints the committee on behalf of the Graduate Council. The committee, once approved by the graduate dean, rather than the department, becomes responsible for the student's academic guidance and evaluation. The chairman of the committee is the director of the candidate's research and is normally a faculty member of the CEE department or a cooperating faculty member. A member may be appointed who is a researcher on campus, from off-campus, or a visiting lecturer within the department; however, a memo indicating the academic degree and affiliation of the nominated member, as well as a curriculum vitae, must accompany such a request. (Memos need not accompany the nomination of an adjunct faculty member.) After the committee is formed, the committee must approve the subject of the thesis. A joint meeting of the committee members and the student should be held before work on the thesis is begun to ensure the topic is clear and acceptable to all. Once the thesis is completed, all three members of the committee must approve the thesis and sign the title page. Students must give a departmental seminar presentation of their thesis work to the department and members of the academic community before completing the thesis.

Normative Time to Degree 6 quarters

Doctoral Degree

The Department of Chemical and Environmental Engineering offers the Ph.D. degree in Chemical and Environmental Engineering. Satisfying the requirements for the degree consists of four parts:

1. Successful completion of an approved program of course work
2. Passing a written preliminary examination
3. Approval of a dissertation proposal
4. Defense and approval of the dissertation

Course Work
Upon choosing a faculty advisor, each Ph.D. student is appointed a Ph.D. advisory committee consisting of two CEE faculty members and the faculty advisor. This advisory committee is responsible for guiding the students in formulating their research activities and preparing for the preliminary and qualifying exams.

The program of course work is formulated by each student and a faculty advisor in the first or second quarter after admission to the program and must be approved by the student's advisor and advisory committee. Every student must complete a program of study that includes:

1. A major area of study intended to increase the student's depth of knowledge in an engineering research specialty and
2. A minor area of study intended to support and increase the student's breadth of knowledge in the major area

The CEE graduate program requires a coherent program of:

1. Sixteen (16) units of core courses and
2. Eight (8) units of graduate and/or upper-division work approved by the advisory committee

None of these credits may be in courses numbered between CEE 250 and CEE 270, CEE 286, CEE 290, CEE 297, CEE 299, or CEE 302.

Preliminary Examination
The preliminary examination tests students' understanding of the fundamental principles of chemical and environmental engineering and students' critical thinking as it relates to engineering research. This exam consists of a critical evaluation of a published scientific journal article, presented orally, followed by questions from a faculty panel on the paper and associated fundamentals. The article will be selected by the faculty panel. The panel will be comprised of faculty from the Chemical and Environmental Engineering department with appropriate expertise in the chosen area of study. On the basis of the oral presentation and answers to questions, the faculty panel will evaluate whether the student passes the exam. Students who fail the examination on the first attempt are granted a second and final attempt to pass a makeup examination. This exam is typically completed during the third quarter of study and after completing four core Chemical and Environmental Engineering graduate courses.

Teaching Requirement
All students must be employed as teaching assistants for at least one quarter. The program's educational objectives are to produce graduates who attain high levels of technical expertise to enable their achievement in diverse environmental engineering practice and research, or in allied careers, prepare them for graduate level education, and enable them to be successful members of the professional community, for the benefit of our constituents.

Oral Qualifying Examination
Selection of the five-member Qualifying Committee is as follows: 2 members selected by the Graduate Committee, 2 members selected by the student, and 1 oversight member. The student's advisor will chair the committee. All members of the qualifying committee are expected to have the appropriate expertise to guide and evaluate a candidate's research. No more than 1 member can be a non-academic senate member. After review of the nominations, the dean of the Graduate Division appoints the committee on behalf of the Graduate Council. This committee becomes responsible for the student's academic guidance and evaluation until advancement to candidacy and administers the qualifying examination.

Dissertation Proposal
After successful completion of the written preliminary examination, each student, with advisement from an advisor, prepares a dissertation proposal. Typically, students submit a dissertation proposal to their qualifying committee within one year after successfully completing the written preliminary examination. The proposal should clearly demonstrate the student's adequate preparation for the completion of the thesis research, which includes but is not limited to a thorough review of the pertinent literature, a presentation and discussion of the candidate's own research, and a detailed research plan with sufficient breadth and depth for the completion of the thesis. The qualifying committee chair schedules an oral defense normally within one month of the written proposal submission. The presentation is given only to the dissertation committee members.

The oral presentation/defense of the proposal focuses on the dissertation problem. Students should demonstrate considerable depth of knowledge in the student's area of specialization and a clear understanding of the research methods that are needed for successful completion of the dissertation research. The oral presentation/defense begins with a presentation by students on their dissertation topic and is followed by questions and suggestions from the qualifying committee.

On the basis of the written proposal and oral defense, the qualifying committee decides whether the student should be advanced to candidacy, asked to modify and enhance the proposal, or requested to withdraw from the program.

Dissertation and Final Oral Examination
Following advancement to candidacy, students formally focus on their dissertation research. The progress of the dissertation is monitored by the student's dissertation committee. Candidates should interact frequently with members of their dissertation committee to ensure that dissertation progress is acceptable.

The graduate committee nominates and approves the dissertation committee after consideration of the suggestions made by the student and thesis advisor. The dissertation committee consists of a minimum of three UCR Academic Senate members. The chair and majority of members must be from Chemical and Environmental Engineering. All committee members should be in a position to offer guidance and be able to judge the scholarship of the dissertation work. Upon recommendation of the graduate advisor, doctoral dissertation committees are appointed by the dean of the Graduate Division.

After completing the dissertation research, students must submit a written copy of the dissertation for approval for defense by the student's dissertation committee. Once a draft has been approved, an oral defense of the dissertation is scheduled. This defense consists of a seminar open to the entire academic community, followed by a question-and-answer period conducted by the dissertation committee.

Students must complete at least six quarters in residence in the UC with a GPA of 3.00 or better in all 100- and 200-level course work related to the degree.

Exam Modality

Oral Qualifying Examination
The Oral Qualifying Exam can be taken in any of the following modes: In-Person, Hybrid, or Remote. After consultation with the student, the faculty advisor will have final approval on the mode to be used. The faculty advisor will consider the nature of the research and practicality of presentation to determine the most suitable mode for remote, in-person, or Hybrid modes. The faculty advisor or student must make request to the graduate advisor for the remote option.

All committee members and the student must be present on campus for the in -person exam.

Some committee members and/or the student will participate remotely and all others will be in person for the Hybrid mode.

All committee members and students will attend remotely, when the remote option is chosen.

Dissertation and Final Oral Examination
The Dissertation and Final Oral Examination follows the same guidelines that govern the Oral Qualifying Exam

Normative Time to Degree
Three years for students with a UCR M.S. degree in Chemical and Environmental Engineering (five years for those without an M.S. degree in Chemical and Environmental Engineering)

Lower-Division Courses

CEE 010 Introduction to Chemical and Environmental Engineering 1 Lecture, 1 hour. Prerequisite(s): none. An introduction to chemical and environmental engineering for engineering and nonengineering majors. Aims to enrich an appreciation of chemical, biochemical, and environmental engineering. Discusses typical careers, key applications, latest developments and the need to engage in lifelong learning in the field. Graded Satisfactory (S) or No Credit (NC).

CEE 011 Introduction to Bioengineering 2 Lecture, 1 hour; laboratory, 3 hours. An introduction to bioengineering for engineering and nonengineering majors. Discusses the application of concepts and methods of the physical sciences and mathematics to problems in the life sciences. Covers typical careers, key applications, latest developments in the field, and the need to engage in lifelong learning. Provides hands-on experiences and includes a field trip. Graded Satisfactory (S) or No Credit (NC).

Upper-Division Courses

CEE 125 Analytical Methods For Chemical and Environmental Engineers 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): CEE 010 (CEE 010 may be taken concurrently); CHEM 001C and CHEM 01LC; CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA; PHYS 040C or PHYS 040HC. Examines chromatographic separations, mass spectrometry, atomic absorption, and electrophoresis. Presents total carbon analysis as an introduction to analytical methods and their use in the chemical and environmental engineering fields.

CEE 132 Green Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 110A or ENVE 171, senior standing or consent of instructor. An introduction to the design, commercialization, and use of feasible and economical processes and products that minimize risks to human health and the environment. Topics covered include environmental risk assessment; regulations; chemical process flow-sheet analysis for pollution prevention; product life-cycle assessment; and industrial ecology. Credit is awarded for only one of CEE 132 or CEE 232.

CEE 135 Chemistry of Materials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA; PHYS 040C or PHYS 040HC. An introduction to the synthesis, structure, properties, and performance of modern materials. Topics include the science of materials, bonding and structure, the strength of materials, electrons in materials, semiconductors, superconductors, and optical properties of materials.

CEE 136 Aerosol Technology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHE 120. Explores the physical and chemical properties of aerosol and its relationship to ambient air quality, control technology, health impacts, and global climate change. Introduces the principles of aerosol measurement and aerosol measurement technology.

CEE 140A Biomaterials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 101 or BCH 100, MATH 010B, PHYS 040B or PHYS 040HB; or consent of instructor. Covers the principles of materials science and engineering, with attention to topics in bioengineering. Explores atomic structures, hard treatment, fundamentals of corrosion, manufacturing processes, and characterization of materials. Cross-listed with BIEN140A.

CEE 140B Biomaterials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 040B or PHYS 040HB; Covers the structure-property relations of metals, ceramics, polymers, and composites, as well as hard and soft tissues such as bone, teeth, cartilage, ligament, skin, muscle, and vasculature. Focuses on behavior of materials in the physiological environment. Cross-listed with BIEN140B.

CEE 146 Surface and Interface Phenomena 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100 or CEE 100A; or consent of instructor. Introduces interactions in interfacial phenomena; contact angle and wetting; adsorption, desorption, and removal; adhesion; aggregation, flocculation and colloidal stability; crystallization and self- and directed-assembly; friction, lubrication, and wear; and surface modifications. Also covers the interdisciplinary nature of interfacial science and its role in developing advanced materials and technologies. Credit is only awarded for CEE 146 or CEE 246.

CEE 158 Professional Development For Engineers 3 Lecture, 3 hours. Prerequisite(s): upper-division standing. A review of various topics relevant to the professional development of chemical engineers. Includes career paths; interview strategies; professional registration and preparation for certification examinations; ethics; risk management and environmental health and safety; regulatory issues; and lifelong learning.

CEE 159 Dynamics of Biological Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005B, MATH 046; or consent of instructor. Covers engineering principles for the analysis and modeling of biological phenomena. Topics include molecular diffusion and transport, membranes, ligand-bioreceptor interactions, enzyme kinetics, and dynamics of metabolic pathways. Examines the application of these principles to the design of bioreactors, bioassays, drug delivery systems, and artificial organs. Cross-listed with BIEN 159.

CEE 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): consent of instructor and Chemical and Environmental Engineering undergraduate program advisor. Directed research on a topic relevant to chemical and environmental engineering. Requires a final written report. Course is repeatable to a maximum of 8 units.

Graduate Courses

CEE 200 Advanced Engineering Computation 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):ENGR 118; graduate standing; or consent of instructor. For CEE 200 online section: enrollment in the Online Master-of-Science in Engineering program. Problem-solving techniques for basic engineering systems including heat and mass transfer, coupled reactions, fluid flow potential, and control.

CEE 202 Transport Phenomena 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 114, CHE 116, CHE 120, ENGR 118; graduate standing; or consent of instructor. For CEE 202 online section: enrollment in the Online Master-in-Science in Engineering program. Topics include transport phenomena, potential flow, and boundary layer theories with applications to simultaneous heat, momentum, and mass transfer. Introduces numerical techniques used to solve advanced transport phenomena problems.

CEE 203 Biomass Conversion to Fuels, Chemicals, Materials, and Power 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of the instructor. Provides current and future sustainable technologies for energy production. Includes key physical and chemical principles governing performance. Considers economics and life cycle implications of energy options. Examines current and projected energy use patterns and impacts on the environment. Considers energy policies that can facilitate introduction of sustainable energy production systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CEE 204 Advanced Kinetics and Reaction Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of the instructor. For CEE 204 online section: enrollment in the Online Master-of-Science in Engineering program. Emphasizes kinetics and mechanisms of heterogeneous reactions in different types of reactors. Specific topics include gas-solid noncatalytic reactions; catalytic surfaces and catalyst characterization; and adsorption, diffusion, reaction, and heat transfer in porous catalysts.

CEE 206 Advanced Chemical Engineering Thermodynamics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 130 or ENVE 130; graduate standing; or consent of instructor. For CEE 206 online section; enrollment in the online Master-in-Science in Engineering program. Application of the laws of thermodynamics to phase and chemical reaction equilibrium. Introduction to statistical thermodynamics, molecular simulations, and the evaluation of thermodynamic properties from molecular simulations.

CEE 207 Air Quality Modeling 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CEE 206, ENVE 134, CEE 202; graduate standing; or consent of instructor. Prepares for research and entry-level positions that require knowledge of empirical and deterministic air quality modeling applications. Covers empirical model derivations and applications, box modeling, chemical transport modeling, model evaluation, model sensitivity analysis, and data visualization. Cross-listed with ENSC 207.

CEE 208 Product Design and Entrepreneurship For Agricultural and Biological Applications 3 Lecture, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Examines the discovery, design, and evaluation processes for biological and agricultural products through team study and project design. Includes participation from various disciplines working together to broaden knowledge and enhance communication skills key to tackling challenges related to agriculture, the environment, human health, and other needs. May be Taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D. Cross-listed with BPSC 208.

CEE 210 Cell Engineering 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CHE 124; graduate standing; or consent of instructor. Introduction to genetic and environmental manipulation of cells for production of proteins and for enhanced biocatalytic and synthetic activities. Topics include cloning and gene expression in different host systems, posttranslational processing, metabolic controls and kinetics, in vivo nuclear magnetic resonance spectroscopy, cell modeling, and sensitivity analysis. Credit is awarded for only one of CEE 210 or CHE 140.

CEE 211 Upstream Processes in Biotechnology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 124, CEE 236, graduate standing; or consent of instructor. Introduces the techniques and laboratory practices of upstream processes including mammalian, animal, and plant cell culture, protein engineering, and bioproduct design. Topics covered include antibody, protein, and biomolecule design, production of proteins and biomolecules by cell culture, and media formulation, sterilization, and quality control of upstream processes.

CEE 212 Bioseparations and Bioprocess Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 124; graduate standing; or consent of instructor. Examines fundamentals of separation processes used to isolate and purify biochemical products such as whole cells, enzymes, food additives, and pharmaceuticals. Covers selected aspects of biochemical engineering such as microbial interactions, economics, and mathematical modeling of bioprocesses.

CEE 215 Environmental Microbial Ecology 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): CEE 225 or CHE 226 or ENVE 120 or ENVE 121; graduate standing. For the CEE 215 online section enrollment in the online Master-of-Science in Engineering Program; graduate standing; or consent of instructor. Introduces fundamental knowledge of microbial community analysis, microbial ecology, and microbe-microbe interactions. Also addresses the molecular tools to analyze microbial communities that are important in environmental engineering and environmental biotechnologies.

CEE 220 Modeling Chemical, Biochemical, and Environmental Processes 4 Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or consent of instructor. Introduces simulation softwares and the use of numerical simulation to solve dynamic chemical, biochemical, and environmental problems. Topics include model formulation and development, model sensitivity studies, and application of simulations to chemical, biochemical, and environmental processes.

CEE 221 Introduction to Microfluidics 4 Lecture, 4 hours. Prerequisite(s): CHE 160A or ENVE 160A; graduate standing; or consent of instructor. Provides a theoretical and practical introduction to microfluidic devices. Covers traditional and new methods for making microfluidic devices and assembly of components into systems. Emphasizes the considerations underlying the design or operation of devices based on pressure-driven or electrokinetic flow. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CEE 222 Fundamentals of Heterogeneous Catalysis 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): CEE 204; graduate standing; or consent of instructor. Explores fundamental phenomenon of chemical reactivity on ground and excited state potential energy surfaces. Quantitatively relates electronic structure of catalytic materials to their chemical reactivity. Covers state-of-the-art experimental and theoretical approaches to studying catalytic reactivity. Provides a holistic understanding of catalysis at an atomic scale. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CHEM 222, and MSE 239A.

CEE 224 Synthesis and Characterization of Nanomaterials 3 Lecture, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers key concepts in synthesis and characterization techniques of nanoscale materials. Explores top down and bottom-up strategies for synthesizing low-dimensional nanomaterials and common techniques for nanoscale materials characterization. Also covers fundamental chemical principles of bonding, electronic structure, and atomic arrangements. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 239B.

CEE 225 Physical-Chemical Separation Processes 4 Lecture, 4 hours. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or consent of instructor. CEE 225 online section: enrollment in the Online Master-in-Science in Engineering

program. Covers concepts of physical and chemical processes relevant to engineered and natural environmental systems. Topics include basic colloid chemistry, DLVO theory, coagulation and flocculation, mechanisms of particle removal in filters and transport in porous media, absorption, disinfection, control of disinfection by-products, and advanced treatment processes such as membranes. Credit is awarded for only one of CEE 225 or ENVE 120.

CEE 226 Biological Unit Processes 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 120, ENVE 142; graduate standing; or consent of instructor. CEE 226 online section: enrollment in the Online Master-in-Science in Engineering program. Theory and design of biological unit processes used in environmental engineering. Suspended growth processes, attached growth processes, digestion processes, and nutrient removal systems are covered. Credit is not awarded for CEE 226 if already awarded for ENVE 121.

CEE 230 Biosensors 4 Lecture 2, Laboratory 6, Prerequisite(s): BCH 110A or BCH 110HA, BCH 110B or BCH 110HB, BIOL 121/MCBL 121, CHE 124; graduate standing; or consent of instructor. Introduces the fundamentals and applications of biosensors. Covers enzyme-, whole cell-, tissue-, and antibody- or antigen-based electrochemical, optical, and piezoelectric biosensors. Applies such knowledge to bioprocess monitoring and control, environmental monitoring, and health care.

CEE 231 Scattering and Reflectometry For Environmental, Material, and Biological Applications 4 Lecture, 3 hours discussion, 5 hours per quarter; laboratory 15 hours per quarter. Prerequisite(s): CEE 206 or equivalent; graduate standing. Covers experimental and theoretical aspects of conventional static and dynamic light scattering, small-angle X-ray scattering, small-angle neutron scattering, X-ray and neutron reflectivity for colloids and biological solutions, surfaces, and interfaces. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CEE 232 Green Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 120; graduate standing; or consent of instructor. A study of the design, commercialization, and use of feasible and economical processes and products that minimize risks to human health and the environment. Topics include environmental issues, risk assessment, and regulations; flow of chemical and manufacturing unit processes and flow-sheet analysis for pollution prevention; product life-cycle assessment; and industrial ecology. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for only one of CEE 132 or CEE 232.

CEE 233 Advanced Air Pollution Control and Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CEE 202; CEE 206; CHEM 008A, CHEM 08LA or CHEM 08HA, CHEM 08HLA; CHEM 008B, CHEM 08LB or CHEM 08HB, CHEM 08HLB; ENVE 133; ENVE 134; graduate standing. For the CEE 233 online section: enrollment in the Master of Science in Engineering program; graduate standing. Covers principles necessary to understand the atmospheric behavior of air pollutants. Topics include gas- and aerosol-phase chemistry, atmospheric diffusion, removal processes and residence times, and the formation and fate of gas and aerosol pollutants.

CEE 234 Vehicle Emissions Control Technology, Measurement Procedures, and Alternative Fuels 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers the nature of gaseous and particulate emissions and the technical aspects of energy efficiency from mobile sources. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CEE 235 Electrochemical Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. For CEE 235/MSE 239C online section; enrollment in the Online Master of Science in Engineering program; graduate standing. Explores the role of thermodynamics, charge transfer kinetics, and mass transfer on the behavior of electrochemical systems. Includes cell thermodynamics, Faradaic and non-Faradaic rate processes, ionic transport, nucleation, and growth theories. Covers applications to chemical sensors, batteries, corrosion, and thin film deposition. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 239C.

CEE 236 Energy: Production, Use, Economics, and Sustainability 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. For CEE 236 online section: enrollment in the Online Master of Science in Engineering program; graduate standing. Provides insights into current and future sustainable energy production technologies including key governing physical and chemical principles. Considers economics and life cycle implications of energy options. Also examines current and projected energy use patterns and environmental impacts. Considers energy policies that can facilitate introduction of sustainable energy production systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CEE 238A Bioprocess Design Laboratory 1 2 Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CHE 124 (CHE 124 may be taken concurrently); graduate standing; or consent of instructor. A detailed introduction to bioprocess design. Covers plant design and heat, mass, and fluid transport, with a focus on upstream processes including bioreactors and feedstocks. Students (individually or in small teams) propose and design a bioprocess. A written report and an oral presentation of the bioprocess design are required.

CEE 238B Bioprocess Design Laboratory 2 3 Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): CEE 238A, graduate standing; or consent of instructor. Covers plant design, heat, mass, and fluid transport, with a focus on downstream separation processes and technoeconomic analysis. Students (individually or in small teams) propose and design a bioprocess. A written report and presentation are required.

CEE 238C Bioprocess Design Laboratory 3 3 Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): CEE 238B, graduate standing; or consent of instructor. Explores the fundamentals and application of bioprocess design. Covers plant design, process technoeconomic analysis and cost sensitivity, and good manufacturing practices. Students (individually or in small teams) propose and design a bioprocess. A written report and presentation are required.

CEE 240 Advanced Computation For Materials Design 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers both desktop computing and high-performance computing (i.e., supercomputing resources) in the engineering sciences to understand and design materials using computational methods. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 229.

CEE 241 Aquatic Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100, ENVE 142; graduate standing; or consent of instructor. CEE 241 online section: enrollment in the Online Master-in-Science in Engineering program. Chemical principles and equilibrium models used to describe the behavior of natural water systems, water and wastewater treatment processes, and pollutant transformations in the aqueous environment. Topics include acid-base chemistry, precipitation, complexation, and redox reactions. Credit is not awarded to CEE 241 if already awarded to ENVE 140.

CEE 242 Pilot Plant Laboratory 4 Lecture, 1 hour; laboratory, 9 hours. Prerequisite(s): ENVE 120, ENVE 121; graduate standing; or consent of instructor. Laboratory investigations of physical, chemical, and biological processes for water treatment, wastewater treatment, and soil remediation.

CEE 243 Advanced Water Treatment Technologies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing consent of instructor. For the CEE 243 online section; enrollment in the Online Master-in-Science in Engineering program; graduate standing; or consent of instructor. Fundamentals of advanced water treatment processes emphasizing membrane separation, advanced oxidation processes, and the application of nanomaterials in environmental engineering applications.

CEE 245 Advanced Hydraulic Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 114, ENVE 142 (ENVE 142 may be taken concurrently); graduate standing; or consent of instructor. An introduction to the basic methods of hydraulic engineering for water quality control. Topics include design and analysis of basic flow and water containment structures, sanitary

and storm sewers, pumps and valves, and pipe networks. Emphasis is given to design projects aimed at developing skills in problem specification, modeling, and analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CEE 246 Surface and Interface Phenomena 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100 or ME 100A; graduate standing; or consent of instructor. Introduces interactions in interfacial phenomena; contact angle and wetting; adsorption, desorption, and removal; adhesion; aggregation, flocculation and colloidal stability; crystallization and self- and directed-assembly; friction, lubrication, and wear; and surface modifications. Also covers the interdisciplinary nature of interfacial science and its role in developing advanced materials and technologies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is only awarded for CEE 146 or CEE 246.

CEE 247 Molecular Thermodynamics of Complex Fluids 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CEE 200 or equivalent, CEE 206, MSE 204/PHYS 212A; or consent of instructor. Introduces recent developments in applied thermodynamics and molecular simulations. Emphasizes current concerns in chemical and environmental engineering such as colloids, polymers, biomacromolecules, and fluids under inhomogeneous conditions.

CEE 248 Quantitative Analysis of Upstream Processes in Biotechnology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CEE 211, graduate standing; or consent of instructor. Examines fundamentals of biomolecular ligand binding, enzyme kinetics, enzyme reaction mechanisms, and whole-cell biocatalysis. Topics include the quantitative description of steady state and pre-steady state enzyme kinetics, the effects of mass transfer on enzyme and whole-cell biocatalysis, and analytical methods to study enzyme kinetics and protein-ligand binding interactions.

CEE 249 Integration of Computational and Experimental Biology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B; MATH 010B, MATH 046, PHYS 040C or PHYS 040HC; graduate standing. BIEN 249/CEE 249 online section: enrollment in the Online Master-in-Science in Engineering program. A multidisciplinary introduction to computational methods used to analyze experimental biological data. Introduction to mathematical concepts needed to understand protein structure and dynamics, protein-protein interactions (structures and networks), gene regulatory networks, signal transduction networks, metabolic networks, and kinetic modeling of cellular processes. Also covers techniques used to derive experimental data. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with BIEN 249.

CEE 250 Special Topics in Chemical and Environmental Engineering 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Seminar in selected topics in chemical and environmental engineering presented by graduate students, staff, faculty, and invited speakers. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 251 Microbial Engineering and Environmental Biotechnology 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Discusses the recent development of novel biocatalysts and biological materials for degrading toxic pollutants or synthesizing environmentally friendly chemicals. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 253 Biodegradation and Bioremediation 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing Reviews current research. Special emphasis is placed on biological techniques for air pollution control, bioremediation of methyl tert-butyl ether, and molecular techniques for microorganism monitoring. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

CEE 254 Organic Electronic Materials 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. A study of design, synthesis, purification, manufacture, and application of carbon-based electronic materials. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with CHEM 267.

CEE 255 Special Topics in Water Quality Engineering 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Involves reports and discussion by students, faculty, and visiting scholars on current research topics in water quality engineering. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 256 Special Topics in Particulate Measurement and Air Quality 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Topics include atmospheric chemistry, aerosol chemistry and physics, and measurement techniques used for source and ambient sampling of gases and aerosols. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

CEE 257 Special Topics of Bio-Nanotechnology 1 to 2 Seminar, 1 hour; consultation, 0 to 1 hour. Prerequisite(s): graduate standing or consent of instructor. Focuses on the application of nanotechnology for further developments in bioengineering and medicine. Students complete presentations on the latest developments in nanotechnology. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 258 Biosensing and Biodetoxification 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Involves oral presentations and intensive small-group discussions of current literature on biological detoxification of hazardous chemicals and biological-based sensors for environmental, clinical, food quality, and process monitoring. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 259 Special Topics in Materials Electrochemistry 1 Seminar, 1 hour. Prerequisite(s): graduate standing Topics include nanoelectrochemical systems, electrochemistry, bioelectrochemistry, magnetic materials, spintronics, microelectromechanical systems/nanoelectromechanical systems (MEMS/NEMS), nanosensor arrays, nanoelectronics, corrosion, fuel cells, batteries, thermoelectric materials, electroenzymology, electrodeposition, electroless deposition, and synthesis of nanowires and nanotubes. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

CEE 260 Structural Ordering in Colloidal Dispersions 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Introduces recent advances in understanding intercolloid forces and self-assembly of colloidal particles for the fabrication of new materials. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 261 Special Topics in Zeolites, Fuel Cells, and Nanostructured Materials 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Covers design, synthesis, and engineering of zeolite thin films for applications in semiconductors and in aerospace; development of fuel cell membranes and electrode catalysts and production of hydrogen; and synthesis and manipulation of nanomaterials. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 262 Special Topics in Systems Biology 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Consists of oral presentations and intense small-group discussions of the current literature and research on computational and experimental aspects of systems biology. Explores high-throughput experiments, experimental design, numerical methods, model development, written and oral presentation skills, ethics, and laboratory techniques. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 263 Membrane Separations 2 Seminar, 2 hours. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or consent of instructor. Covers theoretical

and applied concepts of membrane separation processes. Topics may include basic membrane transport theory, membrane materials and formation processes, advanced colloid and surface chemistry, Derjaguin-Landau-Verwey-Overbeek (DLVO) theory on colloid stability, colloidal hydrodynamics, and transport in porous media. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 265 Special Topics in Microbial Fate and Transport in Aquatic Environments 1 or 2 Seminar, 1 hour; individual study, 0 to 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the theoretical and applied research currently being conducted in the area of microbial pathogen transport in natural and engineered aquatic systems. Topics include the theory of colloid transport and filtration, quantification and analysis of microbial adhesion or deposition kinetics, and whole-cell and molecular-scale microbial analysis techniques. Students who give class presentations receive credit for 2 units; other students receive credit for 1 unit. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 266 Special Topics in Biological Conversion of Biomass 1 or 2 Seminar, 1 hour; individual study, 0 to 3 hours. Prerequisite(s): graduate standing. Consists of oral presentations and small group discussions of current and historic literature on biological conversion of biomass to fuels and chemicals. Students who make presentations receive credit for 2 units; other students receive credit for 1 unit. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 267 Special Topics in Bionanotechnology 2 Seminar, 2 hours. Prerequisite(s): graduate standing. Introduces recent advances in biomimetics, biomineralization, and bio-inspired materials for nanostructures, as well as for energy storage and conversion applications. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 18 units.

CEE 268 Special Topics in Environmental Chemistry 2 Seminar, 2 hours. Prerequisite(s): graduate standing. Addresses the key role that environmental chemical processes play in water quality, pollutant fate, and the development of strategies for the treatment and reuse of contaminated natural resources. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 18 units.

CEE 269 Special Topics in Aerosols and Climate 2 Seminar, 2 hours. Prerequisite(s): graduate standing Introduces research at the interface of particle air quality and climate. Focuses on the effects of particle formation and composition on climate. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

CEE 286 Colloquium in Chemical and Environmental Engineering 1 Colloquium, 1 hour. Prerequisite(s): graduate standing. Lectures on a current research topic in chemical engineering, environmental engineering, and other related fields presented by faculty members and visiting scientists. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual study, directed by a faculty member, of selected topics in chemical and environmental engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

CEE 292 Concurrent Studies in Chemical and Environmental Engineering 1 to 4 Research, 3 to 12 hours. Prerequisite(s): graduate standing; and consent of instructor. To be taken concurrently with a 100-series course but on an individual basis. Devoted to specific additional projects related to the 100-series course. Faculty provide guidance and evaluation throughout the quarter. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

CEE 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Research conducted under the supervision of a faculty member on selected problems in chemical and environmental engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 298I Individual Internship 1 to 12 Written Work, 1 to 12 hours; internship, 2 to 24 hours. Prerequisite(s): graduate standing; consent of instructor. Individual apprenticeship in chemical and environmental engineering with an approved professional individual or organization, and a faculty member. A written report is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

CEE 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing; consent of instructor. Research in chemical and environmental engineering for the M.S. thesis or Ph.D. dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Course

CEE 302 Teaching Practicum 1 to 4 Seminar, 3 to 12 hours. Prerequisite(s): appointment as a teaching assistant or associate in Chemical and Environmental Engineering. Topics include effective teaching methods such as those involved in leading discussion sections, preparing and grading examinations, and student-instructor relations in lower- and upper-division Chemical Engineering and Environmental Engineering courses. Required each quarter of teaching assistants and associates in Chemical and Environmental Engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

Chemical Engineering

Upper-Division Courses

CHE 100 Engineering Thermodynamics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C; MATH 046, may be taken concurrently. An introduction to engineering thermodynamics focusing on chemical and environmental systems. Topics include concepts of equilibrium, temperature, reversibility energy, entropy, the first and second laws, equations of state, and thermodynamic properties. Emphasizes engineering applications for analyzing and designing closed and open systems. Credit is awarded for one of the following CHE 100 or ME 100A.

CHE 102 Catalytic Reaction Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 122 or consent of instructor. Principles of surface reactions and heterogeneous catalysis. Catalyzed reaction kinetics, heterogeneous reactions, diffusion and heterogeneous catalysis, analysis and design of heterogeneous reactors.

CHE 105 Introduction to Nanoscale Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CEE 135, MATH 010A, PHYS 040C or PHYS 040HC; or consent of instructor. An introduction to nanotechnology engineering and its various applications. Includes electromagnetic waves and quantum mechanics; synthesis of nanostructures; assembly of nanostructures; and traditional and nontraditional methods of nanolithography and interactions between electronic and optical properties. Also covers organic heterostructures, nanotubes, and quantum computing.

CHE 110A Chemical Process Analysis 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C, MATH 009C, PHYS 040B or PHYS 040HB; or consent of instructor. Introduces the principles of conservation of mass in chemical process systems. Topics include the development of steady-state mass balances, and application of mass balances to existing industrial processes.

CHE 110B Chemical Process Analysis 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): CHE 110A with a grade of "C-" or better; or consent of instructor. Applies principles of conservation of energy to chemical process systems. Topics include the development of steady-state and unsteady-state energy balances as well as combined mass and energy balances in industrial processes.

CHE 114 Applied Fluid Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 110A or ENVE 171, MATH 010A, MATH 046, PHYS 040B or PHYS 040HB; or consent of instructor. An introduction to fluid statics, fluid flow, and flow of compressible and incompressible fluids in conduits and open-channel flow. Also covers flow past immersed

bodies, transportation and metering of fluids, and agitation and mixing of liquids. Credit is awarded for only one of CHE 114 or ME 113.

CHE 116 Heat Transfer 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100, CHE 114 with a grade of "C-" or better; or consent of instructor. An analysis of heat transfer for Chemical Engineering and Environmental Engineering majors. Topics include steady- and unsteady-state heat conduction, forced convection, basic radiation heat transfer, and design of heat exchangers. Credit is awarded for only one of CHE 116 or ME 116A.

CHE 117 Separation Processes 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 116, CHE 120; or consent of instructor. Covers fundamental concepts and practical techniques for designing equipment based on equilibrium stage processes. Explores gas-liquid absorption, distillation, liquid-liquid extraction, solid-liquid extraction, humidification, drying, and membrane processes.

CHE 118 Process Dynamics and Control 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 117, CHE 122, ENGR 118; or consent of instructor. Fundamentals of process control. Feedback and feedforward control of dynamic processes. Frequency response analysis. Introduction to multivariable control.

CHE 120 Mass Transfer 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 114 with a grade of "C-" or better, MATH 046; or consent of instructor. Introduction to analysis of mass transfer in systems of interest to chemical and environmental engineering practice. Explores transport of matter by diffusion, free, and forced convection.

CHE 122 Chemical Engineering Kinetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100, CHE 110B, CHE 120 (may be taken concurrently), ENGR 118; or consent of instructor. Introduction to homogeneous and heterogeneous kinetics and reactor design for chemical and biochemical processes.

CHE 124 Biochemical Engineering Principles 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110HA or BCH 110A; CHE 120, CHE 122. Examines the principles of biochemical engineering. Topics include kinetics of enzymatic reactions and microbial growth, batch and continuous culture reactors, product formulation, and nutrient utilization. Also studies oxygen transfer, bioreactor scale-up, air and media sterilization, fundamentals of bioreactor design, and bioseparations.

CHE 124L Biochemical Engineering Laboratory 2 Laboratory, 6 hours. Prerequisite(s): CHE 124 or consent of instructor. Laboratory practices in biochemical engineering. Determination of microbial kinetics and biologically mediated reactions, oxygen transfer coefficients. Batch and continuous culturing, air and media sterilization, bioseparations.

CHE 130 Advanced Engineering Thermodynamics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100 or consent of instructor. Advanced study of chemical thermodynamics and their applications to chemical and environmental engineering processes. Applies principles for the thermodynamic behavior of pure solutions and mixtures, phases, and chemical equilibria for homogeneous and heterogeneous systems to a variety of processes common to chemical and environmental engineering. Cross-listed with ENVE 130.

CHE 131 Electrochemical Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 122; or consent of instructor. Explores role of thermodynamics, charge transfer kinetics, and mass transfer on behavior of electrochemical systems. Includes cell thermodynamics, faradaic and non-faradaic rate processes, ionic transport, nucleation and growth theories. Shows applications to chemical sensors, batteries, corrosion, and thin film deposition. Provides in-class demonstrations to illustrate concepts.

CHE 136 Advanced Topics in Heat Transfer 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 116, CHE 120. Advanced study of the computational and theoretical methods associated with heat transfer, fluid flow, and other related processes. Topics include phenomena of heat conduction, convection, and the calculation of flow fields.

CHE 140 Cell Engineering 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CHE 124 or consent of instructor. Introduction to genetic and environmental manipulation of cells for production of proteins and for enhanced biocatalytic and synthetic activities. Cloning and gene expression in different host systems, posttranslational processing, metabolic controls and kinetics, in vivo NMR spectroscopy, cell modeling, and sensitivity analysis. Credit is awarded for only one of CEE 210 or CHE 140.

CHE 150 Biosensors 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BCH 184 or CHE 124 or consent of instructor. Introduces the fundamentals and applications of biosensors. Topics on enzyme-, whole cell-, tissue-, and antibody/antigen-based electrochemical, optical, and piezoelectric biosensors for applications in bioprocess monitoring and control, environmental monitoring, and health care are covered.

CHE 160A Chemical and Environmental Engineering Laboratory 3 Laboratory, 6 hours; discussion, 1 hour. Prerequisite(s): CHE 114; CHE 120. Involves laboratory exercises in chemical and environmental engineering. Experiments cover physical measurements, fluid mechanics, and mass transfer. Emphasizes experimental design, analysis of results, and preparation of engineering reports. Cross-listed with ENVE 160A.

CHE 160B Chemical Engineering Laboratory 3 Laboratory, 6 hours; discussion, 1 hour. Prerequisite(s): CHE 116; CHE 122. Consists of laboratory exercises in chemical engineering. Includes experiments in physical measurements, heat transfer, reactor analysis, and chemical kinetics. Emphasizes experimental design, analysis of results, and preparation of engineering reports.

CHE 160C Chemical Engineering Laboratory 3 Laboratory, 6 hours; discussion, 1 hour. Prerequisite(s): CHE 122; CHE 117, may be taken concurrently; CHE 118, may be taken concurrently; or consent of instructor. Consists of laboratory exercises in chemical engineering. Includes experiments and simulations in separation processes and in process control. Emphasizes experimental design, analysis of results, and preparation of engineering reports.

CHE 161 Nanotechnology Processing Laboratory 3 Laboratory, 6 hours; written work, 3 hours. Prerequisite(s): CHE 100 or consent of instructor. An introduction to growth and characterization techniques that involve nanomaterials and devices. Includes preparing thin films; synthesizing Au and CdS nanoparticles; synthesizing carbon nanotubes; synthesizing alumina nanotemplate; synthesizing gold and nickel nanowires; and assembling of nanowires. Also includes imaging samples with optical, scanning electron microscope, scanning tunneling microscope, and atomic force microscope.

CHE 171 Pollution Control For Chemical Engineers 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CHE 117 or consent of instructor. Principles of industrial pollution control in chemical engineering plants. Regulations, criteria, measurements, and pollution control systems associated with air, wastewater, and solid waste management.

CHE 175A Chemical Process Design 4 Lecture, 1 hour; laboratory, 6 hours; consultation, 1 hour. Prerequisite(s): CHE 117, CHE 122, MATH 010B, senior standing in Chemical Engineering; CHE 118 (may be taken concurrently). Introduction to chemical process plant design procedures through economic analysis and actual design of chemical processes. Addresses practical applications to current chemical and biochemical processes and economic constraints. Concentrates on general design considerations and economic principles. Graded In Progress (IP) until CHE 175A and CHE 175B are completed, at which time a final, letter grade is assigned.

CHE 175B Chemical Process Design 4 Lecture, 1 hour; laboratory, 6 hours; consultation, 1 hour. Prerequisite(s): CHE 175A; senior standing in Chemical Engineering. Introduction to chemical process plant design procedures through economic analysis and actual design of chemical processes. Topics address practical applications to current chemical and biochemical processes and economic constraints. Students complete a detailed analysis and process design of the projects begun in CHE 175A. A final report and oral presentation are required. Satisfactory (S)

or No Credit (NC) grading is not available.

CHE 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): upper-division standing; consent of instructor and department chair. Individual study to meet special curricular needs. Course is repeatable to a maximum of 9 units.



Environmental Engineering

Upper-Division Courses

ENVE 120 Unit Operations and Processes in Environmental Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 120, ENVE 142; or consent of instructor. Introduction to physical and chemical processes used for drinking water and wastewater treatment. Topics include coagulation and flocculation, sedimentation, granular-medium filtration, membrane disinfection, and softening. Credit is awarded for only one of CEE 225 or ENVE 120.

ENVE 121 Biological Unit Processes 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENVE 120, ENVE 142 An introduction to the theory and design of biological unit processes used in environmental engineering. Covers suspended growth processes, attached growth processes, digestion processes, and nutrient removal systems. Credit is awarded for only one of CEE 226 or ENVE 121.

ENVE 130 Advanced Engineering Thermodynamics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100 or consent of instructor. Advanced study of chemical thermodynamics and their applications to chemical and environmental engineering processes. Applies principles for the thermodynamic behavior of pure solutions and mixtures, phases, and chemical equilibria for homogeneous and heterogeneous systems to a variety of processes common to chemical and environmental engineering. Cross-listed with CHE 130.

ENVE 133 Fundamentals of Air Pollution Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 110A or ENVE 171; CHE 114; MATH 046; PHYS 040B or PHYS 040HB; CHEM 008A, may be taken concurrently or CHEM 08HA, may be taken concurrently; or consent of instructor. Covers principles, modeling, and design of systems for atmospheric emission control of pollutants such as photochemical smog and by-products of combustion. Explores the effects of air pollution on health.

ENVE 134 Technology of Air Pollution Control 4 Lecture, 4 hours. Prerequisite(s): ENVE 133. Processes and design of control technologies for gaseous and particulate pollutants. Methods and design of ambient air quality measurements and air pollution source sampling for both gaseous and particulate pollutants.

ENVE 135 Fate and Transport of Environmental Contaminants 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 120; CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB; ENGR 118; ENVE 133; ENVE 142; or consent of instructor. Covers fate and transport of contaminants in the air, water, and soil environments. Addresses description and modeling of advection, dispersion, phase transfer, and chemical transformation mechanisms.

ENVE 138 Combustion Engineering 4 Lecture, 4 hours. Prerequisite(s): CHE 114, ENVE 133. Covers the fundamental development of the engineering and design principles underlying combustion engines and turbines and the associated emission control technology. Includes aspects of fuels, lubricants, instrumentation, chemistry of combustion, and kinetics related to the understanding of engineering processes, engine design, and emission control.

ENVE 140 Aquatic Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100, ENVE 142; or consent of instructor. An introduction to the chemical principles and equilibrium models used to describe the behavior of natural water systems, water and wastewater treatment processes, and pollutant transformations in the aqueous environment. Topics include acid-base chemistry, precipitation, complexation, and redox reactions. Credit is awarded for only one of CEE 241 or ENVE 140.

ENVE 142 Water Quality Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 114 or ENVE 171; or consent of instructor. An introduction to the engineering aspects of water quality management. Addresses water quality characterization and modeling techniques for natural and engineered systems. Discusses application of chemical equilibrium and kinetic models to water quality.

ENVE 144 Solid Waste Management 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 002 or BIOL 005A, BIOL 05LA; CHEM 001C, CHEM 01LC or CHEM 01HC, CHEM 01HLC; ENSC 001, ENSC 002 or ENVE 171; MATH 007B or MATH 009B or MATH 09HB; or consent of instructor. A study of the characterization, collection, transportation, processing, disposal, recycling, and composting of municipal solid waste. Emphasizes accepted management strategies and design procedures for recovering or disposing solid wastes while protecting public and environmental well-being. Cross-listed with ENSC 144.

ENVE 145 Hazardous Waste Management 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENVE 120 and ENVE 142. Advanced course in the study of physio-chemical, thermal, and biological treatment of hazardous waste. Emphasis is placed on the technical understanding and design of physical, biological, and thermal treatment methods; transportation of hazardous waste; and hazardous waste characterization and site assessment.

ENVE 146 Water Quality Systems Design 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 114 or consent of instructor. Analysis and design of water conveyance systems including water distribution networks, wastewater and storm water collection systems, structures for flow measurement and control, and pumps and pump stations. Includes projects to develop design process skills including problem specification, modeling, and analysis.

ENVE 160A Chemical and Environmental Engineering Laboratory 3 Laboratory, 6 hours; discussion, 1 hour. Prerequisite(s): CHE 114; CHE 120. Involves laboratory exercises in chemical and environmental engineering. Experiments cover physical measurements, fluid mechanics, and mass transfer. Emphasizes experimental design, analysis of results, and preparation of engineering reports. Cross-listed with CHE 160A.

ENVE 160B Environmental Engineering Laboratory 3 Laboratory, 6 hours; discussion, 1 hour. Prerequisite(s): ENVE 133. Consists of laboratory exercises in environmental engineering. Includes experiments in physical measurements, reaction kinetics, reactor analysis, and air pollution engineering. Emphasizes experimental design, analysis of results, and preparation of engineering reports.

ENVE 160C Environmental Engineering Laboratory 3 Laboratory, 6 hours; discussion, 1 hour. Prerequisite(s): ENVE 120; ENVE 142. Consists of laboratory exercises in environmental engineering. Includes experiments in physical measurements, water quality, and unit operations and processes. Emphasizes experimental design, analysis of results, and preparation of engineering reports.

ENVE 171 Fundamentals of Environmental Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C, MATH 009C, PHYS 040B or PHYS 040HB; or consent of instructor. An introduction to mass and energy balances. Includes an overview of contaminants and their effects on human health and the environment. Provides a basic understanding of contaminants, their sources, and their movement and fate in the environment.

ENVE 175A Senior Design Project 4 Lecture, 1 hour; laboratory, 6 hours; consultation, 1 hour. Prerequisite(s): ENVE 120; Restricted to class level standing of senior; Restricted to major(s) Environmental Engineering, Environmental Engr BS + MS. Under the direction of a faculty member, students (individually or in small teams with shared responsibilities) propose, design, build, and test environmental engineering devices or systems. Requires a written report giving details of the project and test results and an oral presentation of the design aspects. Graded in-progress until ENVE 175A and ENVE 175B are completed at which time a final letter grade is assigned.

ENVE 175B Senior Design Project 4 Lecture,1 hour; laboratory, 6 hours; consultation,1 hour. Prerequisite(s): senior standing in Environmental Engineering; ENVE 175A. Under the direction of a faculty member, students (individually or in small teams with shared responsibilities) propose, design, build, and test environmental engineering devices or systems. A written report, giving details of the project and test results, and an oral presentation of the design aspects are required. Satisfactory (S) or No Credit (NC) grading is not available.

ENVE 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): upper-division standing; consent of instructor and department chair. Individual study to meet special curricular needs. Course is repeatable to a maximum of 9 units.

Graduate Courses

CEE 200 Advanced Engineering Computation 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):ENGR 118; graduate standing; or consent of instructor. For CEE 200 online section: enrollment in the Online Master-of-Science in Engineering program. Problem-solving techniques for basic engineering systems including heat and mass transfer, coupled reactions, fluid flow potential, and control.

CEE 202 Transport Phenomena 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 114, CHE 116, CHE 120, ENGR 118; graduate standing; or consent of instructor. For CEE 202 online section: enrollment in the Online Master-in-Science in Engineering program. Topics include transport phenomena, potential flow, and boundary layer theories with applications to simultaneous heat, momentum, and mass transfer. Introduces numerical techniques used to solve advanced transport phenomena problems.

CEE 203 Biomass Conversion to Fuels, Chemicals, Materials, and Power 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of the instructor. Provides current and future sustainable technologies for energy production. Includes key physical and chemical principles governing performance. Considers economics and life cycle implications of energy options. Examines current and projected energy use patterns and impacts on the environment. Considers energy policies that can facilitate introduction of sustainable energy production systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CEE 204 Advanced Kinetics and Reaction Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of the instructor. For CEE 204 online section: enrollment in the Online Master-of-Science in Engineering program. Emphasizes kinetics and mechanisms of heterogeneous reactions in different types of reactors. Specific topics include gas-solid noncatalytic reactions; catalytic surfaces and catalyst characterization; and adsorption, diffusion, reaction, and heat transfer in porous catalysts.

CEE 206 Advanced Chemical Engineering Thermodynamics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 130 or ENVE 130; graduate standing; or consent of instructor. For CEE 206 online section; enrollment in the online Master-in-Science in Engineering program. Application of the laws of thermodynamics to phase and chemical reaction equilibrium. Introduction to statistical thermodynamics, molecular simulations, and the evaluation of thermodynamic properties from molecular simulations.

CEE 207 Air Quality Modeling 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CEE 206, ENVE 134, CEE 202; graduate standing; or consent of instructor. Prepares for research and entry-level positions that require knowledge of empirical and deterministic air quality modeling applications. Covers empirical model derivations and applications, box modeling, chemical transport modeling, model evaluation, model sensitivity analysis, and data visualization. Cross-listed with ENSC 207.

CEE 208 Product Design and Entrepreneurship For Agricultural and Biological Applications 3 Lecture, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Examines the discovery, design, and evaluation processes for biological and agricultural products through team study and project design. Includes participation from various disciplines working together to broaden knowledge and enhance communication skills key to tackling challenges related to agriculture, the environment, human health, and other needs. May be Taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D. Cross-listed with BPSC 208.

CEE 210 Cell Engineering 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CHE 124; graduate standing; or consent of instructor. Introduction to genetic and environmental manipulation of cells for production of proteins and for enhanced biocatalytic and synthetic activities. Topics include cloning and gene expression in different host systems, posttranslational processing, metabolic controls and kinetics, in vivo nuclear magnetic resonance spectroscopy, cell modeling, and sensitivity analysis. Credit is awarded for only one of CEE 210 or CHE 140.

CEE 211 Upstream Processes in Biotechnology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 124, CEE 236, graduate standing; or consent of instructor. Introduces the techniques and laboratory practices of upstream processes including mammalian, animal, and plant cell culture, protein engineering, and bioproduct design. Topics covered include antibody, protein, and biomolecule design, production of proteins and biomolecules by cell culture, and media formulation, sterilization, and quality control of upstream processes.

CEE 212 Bioseparations and Bioprocess Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 124; graduate standing; or consent of instructor. Examines fundamentals of separation processes used to isolate and purify biochemical products such as whole cells, enzymes, food additives, and pharmaceuticals. Covers selected aspects of biochemical engineering such as microbial interactions, economics, and mathematical modeling of bioprocesses.

CEE 215 Environmental Microbial Ecology 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): CEE 225 or CHE 226 or ENVE 120 or ENVE 121; graduate standing. For the CEE 215 online section enrollment in the online Master-of-Science in Engineering

Program; graduate standing; or consent of instructor. Introduces fundamental knowledge of microbial community analysis, microbial ecology, and microbe-microbe interactions. Also addresses the molecular tools to analyze microbial communities that are important in environmental engineering and environmental biotechnologies.

CEE 220 Modeling Chemical, Biochemical, and Environmental Processes 4 Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or consent of instructor. Introduces simulation softwares and the use of numerical simulation to solve dynamic chemical, biochemical, and environmental problems. Topics include model formulation and development, model sensitivity studies, and application of simulations to chemical, biochemical, and environmental processes.

CEE 221 Introduction to Microfluidics 4 Lecture, 4 hours. Prerequisite(s): CHE 160A or ENVE 160A; graduate standing; or consent of instructor. Provides a theoretical and practical introduction to microfluidic devices. Covers traditional and new methods for making microfluidic devices and assembly of components into systems. Emphasizes the considerations underlying the design or operation of devices based on pressure-driven or electrokinetic flow. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CEE 222 Fundamentals of Heterogeneous Catalysis 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): CEE 204; graduate standing; or consent of instructor. Explores fundamental phenomenon of chemical reactivity on ground and excited state potential energy surfaces. Quantitatively relates electronic structure of catalytic materials to their chemical reactivity. Covers state-of-the-art experimental and theoretical approaches to studying catalytic reactivity. Provides a holistic understanding of catalysis at an atomic scale. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CHEM 222, and MSE 239A.

CEE 224 Synthesis and Characterization of Nanomaterials 3 Lecture, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers key concepts in synthesis and characterization techniques of nanoscale materials. Explores top down and bottom-up strategies for synthesizing low-dimensional nanomaterials and common techniques for nanoscale materials characterization. Also covers fundamental chemical principles of bonding, electronic structure, and atomic arrangements. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 239B.

CEE 225 Physical-Chemical Separation Processes 4 Lecture, 4 hours. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or consent of instructor. CEE 225 online section: enrollment in the Online Master-in-Science in Engineering program. Covers concepts of physical and chemical processes relevant to engineered and natural environmental systems. Topics include basic colloid chemistry, DLVO theory, coagulation and flocculation, mechanisms of particle removal in filters and transport in porous media, absorption, disinfection, control of disinfection by-products, and advanced treatment processes such as membranes. Credit is awarded for only one of CEE 225 or ENVE 120.

CEE 226 Biological Unit Processes 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 120, ENVE 142; graduate standing; or consent of instructor. CEE 226 online section: enrollment in the Online Master-in-Science in Engineering program. Theory and design of biological unit processes used in environmental engineering. Suspended growth processes, attached growth processes, digestion processes, and nutrient removal systems are covered. Credit is not awarded for CEE 226 if already awarded for ENVE 121.

CEE 230 Biosensors 4 Lecture 2, Laboratory 6, Prerequisite(s): BCH 110A or BCH 110HA, BCH 110B or BCH 110HB, BIOL 121/MCBL 121, CHE 124; graduate standing; or consent of instructor. Introduces the fundamentals and applications of biosensors. Covers enzyme-, whole cell-, tissue-, and antibody- or antigen-based electrochemical, optical, and piezoelectric biosensors. Applies such knowledge to bioprocess monitoring and control, environmental monitoring, and health care.

CEE 231 Scattering and Reflectometry For Environmental, Material, and Biological Applications 4 Lecture, 3 hours discussion, 5 hours per quarter; laboratory 15 hours per quarter. Prerequisite(s): CEE 206 or equivalent; graduate standing. Covers experimental and theoretical aspects of conventional static and dynamic light scattering, small-angle X-ray scattering, small-angle neutron scattering, X-ray and neutron reflectivity for colloids and biological solutions, surfaces, and interfaces. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CEE 232 Green Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 120; graduate standing; or consent of instructor. A study of the design, commercialization, and use of feasible and economical processes and products that minimize risks to human health and the environment. Topics include environmental issues, risk assessment, and regulations; flow of chemical and manufacturing unit processes and flow-sheet analysis for pollution prevention; product life-cycle assessment; and industrial ecology. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for only one of CEE 132 or CEE 232.

CEE 233 Advanced Air Pollution Control and Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CEE 202; CEE 206; CHEM 008A, CHEM 08LA or CHEM 08HA, CHEM 08HLA; CHEM 008B, CHEM 08LB or CHEM 08HB, CHEM 08HLB; ENVE 133; ENVE 134; graduate standing. For the CEE 233 online section: enrollment in the Master of Science in Engineering program; graduate standing. Covers principles necessary to understand the atmospheric behavior of air pollutants. Topics include gas- and aerosol-phase chemistry, atmospheric diffusion, removal processes and residence times, and the formation and fate of gas and aerosol pollutants.

CEE 234 Vehicle Emissions Control Technology, Measurement Procedures, and Alternative Fuels 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers the nature of gaseous and particulate emissions and the technical aspects of energy efficiency from mobile sources. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CEE 235 Electrochemical Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. For CEE 235/MSE 239C online section; enrollment in the Online Master of Science in Engineering program; graduate standing. Explores the role of thermodynamics, charge transfer kinetics, and mass transfer on the behavior of electrochemical systems. Includes cell thermodynamics, Faradaic and non-Faradaic rate processes, ionic transport, nucleation, and growth theories. Covers applications to chemical sensors, batteries, corrosion, and thin film deposition. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 239C.

CEE 236 Energy: Production, Use, Economics, and Sustainability 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. For CEE 236 online section: enrollment in the Online Master of Science in Engineering program; graduate standing. Provides insights into current and future sustainable energy production technologies including key governing physical and chemical principles. Considers economics and life cycle implications of energy options. Also examines current and projected energy use patterns and environmental impacts. Considers energy policies that can facilitate introduction of sustainable energy production systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CEE 238A Bioprocess Design Laboratory 1 2 Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CHE 124 (CHE 124 may be taken concurrently); graduate standing; or consent of instructor. A detailed introduction to bioprocess design. Covers plant design and heat, mass, and fluid transport, with a focus on upstream processes including bioreactors and feedstocks. Students (individually or in small teams) propose and design a bioprocess. A written report and an oral presentation of the bioprocess design are required.

CEE 238B Bioprocess Design Laboratory 2 3 Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): CEE 238A, graduate standing; or consent of instructor. Covers plant design,

heat, mass, and fluid transport, with a focus on downstream separation processes and technoeconomic analysis. Students (individually or in small teams) propose and design a bioprocess. A written report and presentation are required.

CEE 238C Bioprocess Design Laboratory 3 3 Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): CEE 238B, graduate standing; or consent of instructor. Explores the fundamentals and application of bioprocess design. Covers plant design, process technoeconomic analysis and cost sensitivity, and good manufacturing practices. Students (individually or in small teams) propose and design a bioprocess. A written report and presentation are required.

CEE 240 Advanced Computation For Materials Design 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers both desktop computing and high-performance computing (i.e., supercomputing resources) in the engineering sciences to understand and design materials using computational methods. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 229.

CEE 241 Aquatic Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100, ENVE 142; graduate standing; or consent of instructor. CEE 241 online section: enrollment in the Online Master-in-Science in Engineering program. Chemical principles and equilibrium models used to describe the behavior of natural water systems, water and wastewater treatment processes, and pollutant transformations in the aqueous environment. Topics include acid-base chemistry, precipitation, complexation, and redox reactions. Credit is not awarded to CEE 241 if already awarded to ENVE 140.

CEE 242 Pilot Plant Laboratory 4 Lecture, 1 hour; laboratory, 9 hours. Prerequisite(s): ENVE 120, ENVE 121; graduate standing; or consent of instructor. Laboratory investigations of physical, chemical, and biological processes for water treatment, wastewater treatment, and soil remediation.

CEE 243 Advanced Water Treatment Technologies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing consent of instructor. For the CEE 243 online section; enrollment in the Online Master-in-Science in Engineering program; graduate standing; or consent of instructor. Fundamentals of advanced water treatment processes emphasizing membrane separation, advanced oxidation processes, and the application of nanomaterials in environmental engineering applications.

CEE 245 Advanced Hydraulic Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 114, ENVE 142 (ENVE 142 may be taken concurrently); graduate standing; or consent of instructor. An introduction to the basic methods of hydraulic engineering for water quality control. Topics include design and analysis of basic flow and water containment structures, sanitary and storm sewers, pumps and valves, and pipe networks. Emphasis is given to design projects aimed at developing skills in problem specification, modeling, and analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CEE 246 Surface and Interface Phenomena 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHE 100 or ME 100A; graduate standing; or consent of instructor. Introduces interactions in interfacial phenomena; contact angle and wetting; adsorption, desorption, and removal; adhesion; aggregation, flocculation and colloidal stability; crystallization and self- and directed-assembly; friction, lubrication, and wear; and surface modifications. Also covers the interdisciplinary nature of interfacial science and its role in developing advanced materials and technologies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is only awarded for CEE 146 or CEE 246.

CEE 247 Molecular Thermodynamics of Complex Fluids 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CEE 200 or equivalent, CEE 206, MSE 204/PHYS 212A; or consent of instructor. Introduces recent developments in applied thermodynamics and molecular simulations. Emphasizes current concerns in chemical and environmental engineering such as colloids, polymers, biomacromolecules, and fluids under inhomogeneous conditions.

CEE 248 Quantitative Analysis of Upstream Processes in Biotechnology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CEE 211, graduate standing; or consent of instructor. Examines fundamentals of biomolecular ligand binding, enzyme kinetics, enzyme reaction mechanisms, and whole-cell biocatalysis. Topics include the quantitative description of steady state and pre-steady state enzyme kinetics, the effects of mass transfer on enzyme and whole-cell biocatalysis, and analytical methods to study enzyme kinetics and protein-ligand binding interactions.

CEE 249 Integration of Computational and Experimental Biology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B; MATH 010B, MATH 046, PHYS 040C or PHYS 040HC; graduate standing. BIEN 249/CEE 249 online section: enrollment in the Online Master-in-Science in Engineering program. A multidisciplinary introduction to computational methods used to analyze experimental biological data. Introduction to mathematical concepts needed to understand protein structure and dynamics, protein-protein interactions (structures and networks), gene regulatory networks, signal transduction networks, metabolic networks, and kinetic modeling of cellular processes. Also covers techniques used to derive experimental data. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with BIEN 249.

CEE 250 Special Topics in Chemical and Environmental Engineering 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Seminar in selected topics in chemical and environmental engineering presented by graduate students, staff, faculty, and invited speakers. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 251 Microbial Engineering and Environmental Biotechnology 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Discusses the recent development of novel biocatalysts and biological materials for degrading toxic pollutants or synthesizing environmentally friendly chemicals. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 253 Biodegradation and Bioremediation 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing Reviews current research. Special emphasis is placed on biological techniques for air pollution control, bioremediation of methyl tert-butyl ether, and molecular techniques for microorganism monitoring. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

CEE 254 Organic Electronic Materials 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. A study of design, synthesis, purification, manufacture, and application of carbon-based electronic materials. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with CHEM 267.

CEE 255 Special Topics in Water Quality Engineering 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Involves reports and discussion by students, faculty, and visiting scholars on current research topics in water quality engineering. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 256 Special Topics in Particulate Measurement and Air Quality 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Topics include atmospheric chemistry, aerosol chemistry and physics, and measurement techniques used for source and ambient sampling of gases and aerosols. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

CEE 257 Special Topics of Bio-Nanotechnology 1 to 2 Seminar, 1 hour; consultation, 0 to 1 hour. Prerequisite(s): graduate standing or consent of instructor. Focuses on the application of nanotechnology for further developments in bioengineering and medicine. Students complete presentations on the latest developments in nanotechnology. Students who submit a term

paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 258 Biosensing and Biodetoxification 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Involves oral presentations and intensive small-group discussions of current literature on biological detoxification of hazardous chemicals and biological-based sensors for environmental, clinical, food quality, and process monitoring. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 259 Special Topics in Materials Electrochemistry 1 Seminar, 1 hour. Prerequisite(s): graduate standing Topics include nanoelectrochemical systems, electrochemistry, bioelectrochemistry, magnetic materials, spintronics, microelectromechanical systems/ nanoelectromechanical systems (MEMS/NEMS), nanosensor arrays, nanoelectronics, corrosion, fuel cells, batteries, thermoelectric materials, electroenzymology, electrodeposition, electroless deposition, and synthesis of nanowires and nanotubes. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

CEE 260 Structural Ordering in Colloidal Dispersions 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Introduces recent advances in understanding intercolloid forces and self-assembly of colloidal particles for the fabrication of new materials. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 261 Special Topics in Zeolites, Fuel Cells, and Nanostructured Materials 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Covers design, synthesis, and engineering of zeolite thin films for applications in semiconductors and in aerospace; development of fuel cell membranes and electrode catalysts and production of hydrogen; and synthesis and manipulation of nanomaterials. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 262 Special Topics in Systems Biology 1 or 2 Seminar, 1 or 2 hours. Prerequisite(s): graduate standing. Consists of oral presentations and intense small-group discussions of the current literature and research on computational and experimental aspects of systems biology. Explores high-throughput experiments, experimental design, numerical methods, model development, written and oral presentation skills, ethics, and laboratory techniques. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 263 Membrane Separations 2 Seminar, 2 hours. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or consent of instructor. Covers theoretical and applied concepts of membrane separation processes. Topics may include basic membrane transport theory, membrane materials and formation processes, advanced colloid and surface chemistry, Derjaguin-Landau-Verwey-Overbeek (DLVO) theory on colloid stability, colloidal hydrodynamics, and transport in porous media. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 265 Special Topics in Microbial Fate and Transport in Aquatic Environments 1 or 2 Seminar, 1 hour; individual study, 0 to 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the theoretical and applied research currently being conducted in the area of microbial pathogen transport in natural and engineered aquatic systems. Topics include the theory of colloid transport and filtration, quantification and analysis of microbial adhesion or deposition kinetics, and whole-cell and molecular-scale microbial analysis techniques. Students who give class presentations receive credit for 2 units; other students receive credit for 1 unit. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 266 Special Topics in Biological Conversion of Biomass 1 or 2 Seminar, 1 hour; individual study, 0 to 3 hours. Prerequisite(s): graduate standing. Consists of oral presentations and small group discussions of current and historic literature on biological conversion of biomass to fuels and chemicals. Students who make presentations receive credit for 2 units; other students receive credit for 1 unit. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 267 Special Topics in Bionanotechnology 2 Seminar, 2 hours. Prerequisite(s): graduate standing. Introduces recent advances in biomimetics, biomineralization, and bio-inspired materials for nanostructures, as well as for energy storage and conversion applications. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 18 units.

CEE 268 Special Topics in Environmental Chemistry 2 Seminar, 2 hours. Prerequisite(s): graduate standing. Addresses the key role that environmental chemical processes play in water quality, pollutant fate, and the development of strategies for the treatment and reuse of contaminated natural resources. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 18 units.

CEE 269 Special Topics in Aerosols and Climate 2 Seminar, 2 hours. Prerequisite(s): graduate standing Introduces research at the interface of particle air quality and climate. Focuses on the effects of particle formation and composition on climate. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

CEE 286 Colloquium in Chemical and Environmental Engineering 1 Colloquium, 1 hour. Prerequisite(s): graduate standing. Lectures on a current research topic in chemical engineering, environmental engineering, and other related fields presented by faculty members and visiting scientists. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual study, directed by a faculty member, of selected topics in chemical and environmental engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

CEE 292 Concurrent Studies in Chemical and Environmental Engineering 1 to 4 Research, 3 to 12 hours. Prerequisite(s): graduate standing; and consent of instructor. To be taken concurrently with a 100-series course but on an individual basis. Devoted to specific additional projects related to the 100-series course. Faculty provide guidance and evaluation throughout the quarter. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

CEE 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Research conducted under the supervision of a faculty member on selected problems in chemical and environmental engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 298I Individual Internship 1 to 12 Written Work, 1 to 12 hours; internship, 2 to 24 hours. Prerequisite(s): graduate standing; consent of instructor. Individual apprenticeship in chemical and environmental engineering with an approved professional individual or organization, and a faculty member. A written report is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

CEE 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing; consent of instructor. Research in chemical and environmental engineering for the M.S. thesis or Ph.D. dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Course

CEE 302 Teaching Practicum 1 to 4 Seminar, 3 to 12 hours. Prerequisite(s): appointment as a teaching assistant or associate in Chemical and Environmental Engineering. Topics include effective teaching methods such as those involved in leading discussion sections, preparing and grading examinations, and student-instructor relations in lower- and upper-division Chemical Engineering and Environmental Engineering courses. Required each quarter of teaching assistants and associates in Chemical and Environmental Engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

Chemistry

Subject abbreviation: CHEM
College of Natural and Agricultural Sciences

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Chia-En A. Chang, Ph.D., Vice Chair
Department Office, 248 Chemical Sciences
(951) 827-3789; chem.ucr.edu

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Michael Pirrung, Ph.D.
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Francisco Zaera, Ph.D.

Professors
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Christopher J. Bardeen, Ph.D.
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Chia-En A. Chang, Ph.D.
Quan "Jason" Cheng, Ph.D.
Matthew Conley, Ph.D.
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Assistant Professors
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Samuel Mann, Ph.D.
William Neary, Ph.D.
Timothy Su, Ph.D.
Linlin Zhao, Ph.D.
Yifan Dong, Ph.D.
Yue Wu, Ph.D.

**

Lecturer with Security of Employment
Matthew Casselman, Ph.D.
Jack Eichler, Ph.D.

Lecturer with Potential for Security of Employment
Trevor Buldoc, Ph.D.
Joshua Hartman, Ph.D.

Cooperating Faculty
Roya Bahreini, Ph.D. (Atmospheric Science)
Richard J. Debus, Ph.D. (Biochemistry)
Yuchen Guo, Ph.D. (Chemical & Environmental Engineering)
Cengiz Ozkan, Ph.D. (Mechanical Engineering)
Mihri Ozkan, Ph.D. (Electrical and Computer Engineering)
Giulia Palermo, Ph.D. (Bioengineering)
Valentine Vullev, Ph.D. (Bioengineering)

Major

The Department of Chemistry offers a B.S. and B.A. degree in Chemistry and a B.S. in Chemistry with a Chemical Physics option or an Environmental Chemistry option.

The B.S. program is approved by the American Chemical Society and is designed for students interested in a professionally oriented major leading most often to a career or advanced study in chemistry.

The B.A. program is designed for students who wish to obtain a broad educational background with less intensive emphasis on chemistry. In this program, students have increased ease in meeting requirements for such areas as premedical, predental, or prepharmaceutical science; education; and administration. Check careers.ucr.edu.

A **Chemical Physics option** is available for students who wish to prepare for admission to a graduate program in chemical physics.

The **Environmental Chemistry option** is available for students who wish to become familiar with environmental processes and problems related to air, water, and soil, and to apply their chemical knowledge working in environmental-related areas. This option also prepares students for admission to a graduate program emphasizing environmental chemistry.

Pre-Health Science Chemistry majors in either the B.S. or B.A. programs can prepare for admission to medical, pharmacy, or dental schools by carefully planning their programs of study. Students planning to apply for post-graduate studies in the health sciences should make it a special point to consult with their Chemistry advisor early in their studies at UCR. Check hpac.ucr.edu.

Teaching Credential

Teachers in the public schools in California must have a credential approved by the State Commission on Teacher Credentialing. The credential requires an undergraduate major, baccalaureate degree, and completion of a graduate credential program such as that offered by the School of Education at UCR (see Education in this catalog and education.ucr.edu).

UCR has an approved undergraduate program for Chemistry majors who plan to get a Multiple Subjects Credential and teach in the elementary (K-6) grades. A breadth of course work is necessary, in addition to the specified requirements for the major. Students are urged to start early, preferably as freshmen, selecting courses most helpful for this career. Details and counseling on the Bridge to Teaching Program, a preparation program for the multiple subjects credential, are available in the Office of Interdisciplinary Programs, 3111 Interdisciplinary Building South (INTS), (951) 827-1584; lsnid.ucr.edu. Details and counseling on other programs are available in the School of Education and https://education.ucr.edu/teacher-education.

UCR does not yet have a state-approved undergraduate program for chemistry majors who wish to teach at the secondary level. The Teaching Credential in Science, chemistry emphasis, is required for chemistry teachers, grades 7-12. Students who plan to get this credential must take the commission's subject-matter assessment examination and should make certain their academic program includes preparatory course work. The examination includes chemistry in depth and general science with introductory, college-level biology, chemistry, physics, and geoscience (geology, meteorology, oceanography, astronomy).

Further information about courses, requirements, and examinations can be obtained in orientation meetings and the School of Education (1124 Sproul Hall).

California Teach-Science and Mathematics Initiative (CalTeach-SMI)
California Teach-Science and Mathematics Initiative (CalTeach-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CalTeach-SMI at UCR offers undergraduate students paid/unpaid opportunities, such as the Scholar Apprentice Program, to explore STEM teaching as a career option. Through CalTeach-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The CalTeach-SMI Resource Center provides future STEM teachers with material and financial resources to promote planning and professional development towards a science/mathematics education career.

For more information about the CalTeach-SMI program, please visit smi.ucr.edu, the Resource Center at 1114 Pierce Hall, or on Facebook at facebook.com/ScienceMathInitiativeAtUcr and on Instagram at instagram.com/smiatucr/.

Transfer Students

Students transferring to the Chemistry major must complete courses comparable to the following one-year sequences before they transfer:

1. General chemistry, equivalent to CHEM 001A or CHEM 002A, CHEM 001B or CHEM 002B, CHEM 001C or CHEM 002C, CHEM 01LA or CHEM 02LA, CHEM 01LB or CHEM 02LB, CHEM 01LC or CHEM 02LC, each course completed with a grade of "C" or better
2. First-year calculus, equivalent to MATH 009A, MATH 009B, MATH 009C, each course completed with a grade of "C" or better

At least one of the following one-year sequences:

1. General physics (calculus-based) equivalent

to PHYS 040A, PHYS 040B, PHYS 040C, each course completed with a grade of "C" or better (strongly recommended)

2. Second-year calculus, equivalent to MATH 010A, MATH 010B, MATH 046, each course completed with a grade of "C" or better
3. Organic chemistry (one-year lower-division), each course completed with a grade of "B" or better

Students must have a minimum grade point average of 2.70 in transferable college courses. UCR has articulation agreements with most of the California community colleges. These agreements list specific community college courses that have been designated as comparable to UCR courses (see the statewide articulation web site at **assist.org**). Transfer students will usually find it advantageous to complete most or all sequences before starting at UCR. All prospective transfers should try to complete the sequences they begin rather than divide a sequence between two campuses.

Change of Major Criteria

General requirement:

1. Students must be in good academic standing with 2.0 cumulative GPA and 2.0 upper- division chemistry major GPA.
2. Grades for all chemistry core and required lower-division math and physics courses must be "C-" or better.
3. A grade of "C-" or better in each of the courses used to satisfy the 20-unit CNAS Natural Science and Mathematics breadth requirement.
4. AP credit is not accepted for lower-division chemistry courses.

Specific requirement:

If student has completed less than 45 units (first year students), then

- Completion of CHEM 001A or CHEM 002A or CHEM 01HA, CHEM 01LA or CHEM 02LA or CHEM 01HLA, MATH 009A

If student has completed between 45 and 90 units (second year students), then

- Completion of MATH 009A or MATH 005A, MATH 009B or MATH 005B, MATH 009C or MATH 005C
- Completion of CHEM 001A or CHEM 002A or CHEM 01HA, CHEM 001B or CHEM 002B or CHEM 01HB, CHEM 001C or CHEM 002C or CHEM 01HC, CHEM 01LA or CHEM 02LA or CHEM 01HLA, CHEM 01LB or CHEM 02LB or CHEM 01HLB, CHEM 01LC or CHEM 02LC or CHEM 01HLC and PHYS 040A or PHYS 002A and PHYS 02LA (PHYS 002A & PHYS 02LA can be used for B.A. program only)

If student has completed between 90 and 135 units (third year students), then

- Completion of all lower-division math requirements (MATH 009A or MATH 005A, MATH 009B or MATH 005B, MATH 009C or MATH 005C, MATH 010A for B.A. program; and MATH 009A or MATH 005A, MATH 009B or MATH 005B, MATH 009C or MATH 005C, MATH 010A, and two out of the following: MATH 010B, MATH 031, MATH 046 for B.S. program).
- Completion of the following chemistry courses (CHEM 001A or CHEM 002A, CHEM 001B or CHEM 002B, CHEM 001C or CHEM 002C, CHEM 01LA or CHEM 02LA, CHEM 01LB or CHEM 02LB, CHEM 01LC or CHEM 02LC, CHEM 005, CHEM 008A and CHEM 08LA, CHEM 008B and CHEM 08LB, CHEM 008C and CHEM 08LC (or CHEM 08HA and CHEM 08HLA, CHEM 08HB and CHEM 08HLB, CHEM 08HC and CHEM 08HLC).
- Completion of all lower-division physics requirements (PHYS 040A, PHYS 040B, PHYS 040C or PHYS 002A, PHYS 002B, PHYS 002C and PHYS 02LA, PHYS 02LB, PHYS 02LC) (Phys 002A, PHYS 002B, PHYS 002C and PHYS 02LA, PHYS 02LB, PHYS 02LC can be used for B.A. program only)

If student has completed more than 135 units (fourth year students), then

- Completion of all lower-division math requirements (MATH 009A or MATH 005A, MATH 009B or MATH 005B, MATH 009C or MATH 005C, MATH 010A for B.A. program; and MATH 009A or MATH 005A, MATH 009B or MATH 005B, MATH 009C or MATH 005C, MATH 010A, and two out of the following: MATH 010B, MATH 031, MATH 046 for B.S. program).
- Completion of all lower-division chemistry courses (CHEM 001A or CHEM 002A, CHEM 001B or CHEM 002B, CHEM 001C or CHEM002C, CHEM 01LA or CHEM 02LA, CHEM 01LB or CHEM 02LB, CHEM 01LC or CHEM 02LC, CHEM 005, CHEM 008A and CHEM 08LA, CHEM 008B and CHEM 08LB, CHEM 008C and CHEM 08LC (or CHEM 08HA and CHEM 08HLA, CHEM 08HB and CHEM 08HLB, CHEM 08HC and CHEM 08HLC).
- Completion of all lower-division physics requirements (PHYS 040A, PHYS 040B, PHYS 040C or PHYS 002A, PHYS 002B, PHYS 002C and PHYS 02LA, PHYS 02LB, PHYS 02LC) (PHYS 002A, PHYS 002B, PHYS 002C and PHYS 02LA, PHYS 02LB, PHYS 02LC can be used for B.A. program only)
- Completion of upper-division chemistry courses (CHEM 125 and CHEM 150A)

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a professional academic advisor at the CNAS Advising Center, 1223 Pierce Hall.

Major Requirements

The major requirements for the B.A. and the B.S. degree in Chemistry are as follows:

Bachelor of Arts

1. **Lower-division requirements (63 units)**
   a) CHEM 001A or CHEM 002A, CHEM 001B or CHEM 002B, CHEM 001C or CHEM 002C, CHEM 01LA or CHEM 02LA, CHEM 01LB or CHEM 02LB, CHEM 01LC or CHEM 02LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC), CHEM 005, CHEM 008A and CHEM 08LA, CHEM 008B and CHEM 08LB, CHEM 008C and CHEM 08LC (or CHEM 08HA and CHEM 08HLA, CHEM 08HB and CHEM 08HLB, CHEM 08HC and CHEM 08HLC)
   b) MATH 009A or MATH 005A, MATH 009B or MATH 005B, MATH 009C or MATH 005C, MATH 010A
   c) PHYS 040A, PHYS 040B, PHYS 040C (or PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC)
2. **Upper-division requirements (36 units)**A minimum grade of "C-" for any upper-division course used to fulfill the requirements for the B.A. degree.
   a) CHEM 110A, CHEM 110B, CHEM 113, CHEM 125, CHEM 150A, CHEM 191, and either CHEM 111 or CHEM 140 or CHEM 155 or CHEM 166
   b) Ten (10) additional upper-division units

Chemistry with Education Focus Option

Students must consult with their Chemistry advisor before electing this option.

1. **Lower Division Requirements (66 units)**
   a) CHEM 001A or CHEM 002A, CHEM 001B or CHEM 002B, CHEM 001C or CHEM 002C, CHEM 01LA or CHEM 02LA, CHEM 01LB or CHEM 02LB, CHEM 01LC or CHEM 02LC (or CHEM 01HA, CHEM 01HB, CHEM 01HC and CHEM 1HLA, CHEM 1HLB, CHEM 1HLC), CHEM 005, CHEM 008A and CHEM 08LA, CHEM 008B and CHEM 08LB, CHEM 008C and CHEM 08LC (or CHEM 08HA and CHEM 08HLA, CHEM 08HB and CHEM 08HLB, CHEM 08HC and CHEM 08HLC)
   b) MATH 009A or MATH 007A or MATH 005A, MATH 009B or MATH 007B or MATH 005B, MATH 009C or MATH 005C, MATH 010A
   c) PHYS 040A, PHYS 040B, PHYS 040C (or PHYS 002A and PHYS 02LA, PHYS 002B and PHYS 02LB, PHYS 002C and PHYS 02LC)
   d) EDUC 003
2. **Upper Division Requirements (40-41 units)** A minimum grade of "C- "for any upper-division course used to fulfill the requirements for Chemistry with Education Focus option.
   a) CHEM 110A, CHEM 110B, CHEM 113, CHEM 125, CHEM 150A, CHEM 191, and either CHEM 111 or CHEM 140 or CHEM 155 or CHEM 166
   b) EDUC 105, CHEM 141 and one course from EDUC 147 or EDUC 162
   c) CHEM 143 or BCH 100 or BCH 110A

Bachelor of Science

1. **Lower-division requirements (71-72 units)**
   a) CHEM 001A or CHEM 002A, CHEM 001B or CHEM 002B, CHEM 001C or CHEM 002C, CHEM 01LA or CHEM 02LA, CHEM 01LB or CHEM 02LB, CHEM 01LC or CHEM 02LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC), CHEM 005, CHEM 008A and CHEM 08LA or, CHEM 008B and CHEM 08LB,

CHEM 008C and CHEM 08LC (or CHEM 08HA and CHEM 08HLA, CHEM 08HB and CHEM 08HLB, CHEM 08HC and CHEM 08HLC)

b) MATH 009A or MATH 005A, MATH 009B or MATH 005B, MATH 009C or MATH 005C, MATH 010A, and two out of the following: MATH 010B, MATH 031, MATH046

c) PHYS 040A, PHYS 040B, PHYS 040C

2. **Upper-division requirements (41-43 units)**
A minimum grade of "C-" for any upper-division course used to fulfill the requirements for the B.S. degree.

a) CHEM 110A, CHEM 110B, CHEM 111, CHEM 113, CHEM 125, CHEM 150A, CHEM 191

b) TTwo laboratory courses from CHEM 114, CHEM 140, CHEM 155, CHEM 166, BCH 162

c) One course from BCH 100, BCH 110A, CHEM 143

d) One 4-unit course from CHEM 135/ ENSC 135/ENTX 135, CHEM 136/ENSC 136, CHEM 150B, CHEM 197, CHEM 199. CHEM 197 and CHEM 199 must be taken for a grade and a written report submitted.

Chemical Physics Option

Students must consult with their Chemistry advisor before electing this option.

1. **Lower-division requirements (74-75 units)**

a) CHEM 001A or CHEM 002A, CHEM 001B or CHEM 002B, CHEM 001C or CHEM 002C, CHEM 01LA or CHEM 02LA, CHEM 01LB or CHEM 02LB, CHEM 01LC or CHEM 02LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 01HLB, CHEM 01HC and CHEM 1HLC), CHEM 008A and CHEM 08LA, CHEM 008B and CHEM 08LB, CHEM 008C and CHEM 08LC (or CHEM 08HA and CHEM 08HLA, CHEM 08HB and CHEM 08HLB, CHEM 08HC and CHEM 08HLC)

b) MATH 009A or MATH 005A, MATH 009B or MATH 005B, MATH 009C or MATH 005C, MATH 010A, and two of the following: MATH 010B, MATH 031, MATH046

c) PHYS 041A, PHYS 041B, PHYS 41C or PHYS 040A, PHYS 040B, PHYS 040C, and PHYS 041C

2. **Upper-division requirements (45 units)**
A minimum grade of "C-" for any upper-division course used to fulfill the requirements for the Chemical Physics option.

a) CHEM 110A, CHEM 110B, CHEM 111, CHEM 113, CHEM 150A, CHEM 191

b) Twenty (20) units of upper-division course work in Mathematics or Physics (110 or above excluding 190 series)

c) CHEM 197 or CHEM 199, with an emphasis on physical chemistry research (4 units). 4 additional units of CHEM 197 or 199 can be used to replace 4 units of the 20 units of MATH/PHYS requirement, subject to advisor approval.

Environmental Chemistry Option

Students must consult with their Chemistry advisor before electing this option.

1. **Lower-division requirements (71-72 units)**

a) CHEM 001A or CHEM 002A, CHEM 001B or CHEM 002B, CHEM 001C or CHEM 002C, CHEM 01LA or CHEM 02LA, CHEM 01LB or CHEM 02LB, CHEM 01LC or CHEM 02LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC), CHEM 005, CHEM 008A and CHEM 08LA, CHEM 008B and CHEM 08LB, CHEM 008C and CHEM 08LC (or CHEM 08HA and CHEM, CHEM 08HB and CHEM 08HLB, CHEM 08HC and CHEM 08HLC)

b) MATH 009A or MATH 005A, MATH 009B or MATH 005B, MATH 009C or MATH 005C, MATH 010A, and two of the following: MATH 010B, MATH 031, MATH 046

c) PHYS 040A, PHYS 040B, PHYS 040C

2. **Upper-division requirements (49-50 units)**
A minimum grade of "C-" for any upper-division course used to fulfill the requirements for the Environmental Chemistry option.

a) CHEM 110A, CHEM 110B, CHEM 111, CHEM 125, CHEM 140, CHEM 150A, CHEM 191

b) One course from BCH 100, BCH 110A, or CHEM 143

c) Two courses from CHEM 113, CHEM 150B, CHEM 155, CHEM 166, CHEM 197, CHEM 199, (4 units total from CHEM 197 or CHEM 199)

d) Three courses from: ENSC 102 or CHEM 135/ENSC 135/ENTX 135; ENSC 100 or ENSC 104; ENSC 101 or CHEM 136/ENSC 136; ENTX 101 or ENSC 140

Chemistry with Education Focus Option

Students must consult with their Chemistry advisor before electing this option

1. **Lower Division Requirements (74–75 units)**

A) CHEM 001A or CHEM 002A, CHEM 001B or CHEM 002B, CHEM 001C or CHEM 002C, CHEM 01LA or CHEM 02LA, CHEM 01LB or CHEM 02LB, CHEM 01LC or CHEM 02LC (or CHEM 01HA, CHEM 01HB, CHEM 01HC and CHEM 1HLA, CHEM 1HLB, CHEM 1HLC), CHEM 005, CHEM 008A and CHEM 08LA, CHEM 008B and CHEM 08LB, CHEM 008C and CHEM 08LC (or CHEM 08HA and CHEM 08HLA, CHEM 08HB and CHEM 08HLB, CHEM 08HC and CHEM 08HLC)

B) MATH 009A or MATH 005A, MATH 009B or MATH 005B, MATH 009C or MATH 005C, MATH 010A, and two of the following: MATH 010B, MATH 031, MATH 046

C) PHYS 040A, PHYS 040B, PHYS 040C

D) EDUC 003

2. **Upper Division Requirements (52–54 units)**
A minimum grade of "C- "for any upper-division course used to fulfill the requirements for the Chemistry with Education Focus option.

A) CHEM 110A, CHEM 110B, CHEM 111, CHEM 113, CHEM 150A, CHEM 125, CHEM 191

B) EEDUC 105, CHEM 141, and one course from EDUC 147 or EDUC 162

C) Two laboratory courses from CHEM 114, CHEM 140, CHEM 166, CHEM 155, BCH 162

D) One course from BCH 100, BCH 110A, CHEM 143

E) One 4-unit course from CHEM 135/ ENSC 135/ENTX 135, CHEM 136/ENSC 136, CHEM 150B, CHEM 197, CHEM 199.

CHEM 197 and CHEM 199 must be taken for a grade and a written report submitted.

Undergraduate Research is strongly encouraged for students with the requisite ability. Students wishing to participate in this activity should consult Chemistry faculty, their Chemistry advisor, or check: **ugr.ucr.edu**.



Sample Program

Student programs are planned on an individual basis with their advisors, and there is considerable flexibility in the sequence in which courses required for the major are taken. For example, PHYS 040A, PHYS 040B, PHYS 040C can be started equally well during either the freshman or sophomore year. The sample program is typical for a well-prepared entering freshman who seeks the B.S. degree.

Freshman Year	Fall	Winter	Spring
CHEM 001A or CHEM002A, CHEM 001B or CHEM 002B, CHEM 001C or CHEM 002C, CHEM 01LA or CHEM 02LA, CHEM 01LB or CHEM 02LB, CHEM 01LC or CHEM 02LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC)	4,1	4,1	4,1
PHYS 040A, PHYS 040B		5	5
MATH 009A or MATH 005A, MATH 009B or MATH 005B, MATH 009C or MATH 005C	4	4	4
ENGL 001A, ENGL 001B, ENGL 001C	4	4	4
Elective (optional)	4		
Total Units	**17**	**18**	**18**
Sophomore Year	**Fall**	**Winter**	**Spring**
CHEM 008A, CHEM 008B, CHEM 008C CHEM 008LA, CHEM 008LB, CHEM 008LC	4	4	4
PHYS 040C	5		
MATH 010A, MATH 010B, MATH 031, MATH 046	4	4	4
CHEM 005		5	
Electives		4	8
Total Units	**13**	**17**	**16**
Junior Year	**Fall**	**Winter**	**Spring**
CHEM 110A, CHEM 110B, CHEM 113	4	4	4
Biological Science w/Lab			4
CHEM 150A, CHEM 150B		4	4
CHEM 125	5		
CHEM 143		3	
CHEM 191			1
Electives	4	4	8
Total Units	**13**	**15**	**17**
Senior Year	**Fall**	**Winter**	**Spring**
CHEM 111, CHEM 140		4	4
CHEM 155			4
Electives	12	8	4
Total Units	**12**	**12**	**12**

Minor

The minor in Chemistry consists of 21 upper-division units in chemistry.

1. Of the specified upper-division units, a minimum of 16 units must be unique to the minor and may not be used to satisfy major requirements.
2. At least one the courses used to satisfy the 21 units must be in CHEM 125, CHEM 111, CHEM 140, CHEM 155 or CHEM 166 (courses which include laboratory work).
3. No more than 8 units of 190-199 courses may be used in fulfilling the upper-division units for a minor.

All of the upper-division courses in chemistry have a prerequisite of CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC, or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC, or CHEM 002A and CHEM 02LA, CHEM 002B and CHEM 02LB, CHEM 002C and CHEM 02LC and most have CHEM 005 as a prerequisite.

Students with a minor in Chemistry should consult with their Chemistry advisor to construct a specific program consistent with their career goals.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Graduate Program

The Chemistry Department offers the M.S. and Ph.D. degrees in Chemistry.

Fields of specialization (subdisciplines) are analytical chemistry, inorganic chemistry, organic chemistry, and physical chemistry. Research is also carried out in bioanalytical, bioinorganic, bioorganic, and biophysical chemistry and in chemical physics, environmental/atmospheric, organometallic chemistry, and neuroscience. For additional information on the latter, please see Neuroscience Graduate Program in the Programs and Courses section of this catalog.

Admission

The department normally considers applications for teaching and research assistantships at the same time as fellowships; therefore, students are strongly encouraged to complete their applications for admission and support as early as possible. Normally applications for fellowships are awarded by February for students entering in the following fall quarter. Although most students begin in the fall quarter, students may begin their studies in the winter or spring quarter.

Orientation Examinations

Admitted students must, at the beginning of their first quarter in residence, take orientation examinations. The examinations are normally given during two consecutive days starting up to one week prior to the first day of instruction. Although a notice of the times and places of these examinations is sent to each student admitted to regular graduate status in chemistry, it is the student's responsibility to be on the campus early enough to check the bulletin boards in Chemical Sciences for this information. Students take these examinations in the four subdisciplines: analytical, inorganic, organic, and physical chemistry. The purpose of these examinations is to assess the student's undergraduate preparation. The results permit the faculty to determine the course program that will most effectively aid the students' development in their chosen subdisciplines.

Master's Degree

The Department of Chemistry offers the M.S. degree in Chemistry.

Requirements are:

1. Satisfactory performance in orientation examinations in analytical, inorganic, organic, and physical chemistry
2. General university requirements and departmental requirements for either Plan I or Plan II.

Plan I (Thesis)

Students must take at least 36 units of approved courses and graduate research of which five regular lecture courses in the CHEM 200-249 series (CHEM 110A or CHEM 110B, CHEM 113, CHEM 125, and CHEM 150A or CHEM 150B may apply under certain circumstances). A maximum of 12 units of seminar courses (CHEM 250-259) and a maximum of 12 units of graduate research; (but not those numbered CHEM 260-289) may apply towards the 36 units. Students must complete a thesis, and a final oral examination on the thesis may be required.

A final oral examination will occur in an in-person format by default, with the student and all committee members physically present in the exam room. If one or more participants is unable to attend an in-person exam within the appropriate time frame, some or all participants may attend remotely via video conferencing software. The decision to adopt a remote or hybrid exam modality should be mutually agreed upon by the committee chair and the student, and the student must notify the Graduate Advisor of the change prior to the exam. If the exam participants cannot reach a consensus regarding the exam modality, the Graduate Advisor will arbitrate the modality.

Plan II (Comprehensive Examination)

Students must complete at least 36 units of approved courses of which at least 18 must be in regular lecture courses numbered CHEM 200-249 (CHEM 110A or CHEM 110B, CHEM 113, CHEM 125, and CHEM 150A or CHEM 150B may apply under certain circumstances) and up to 12 units of graduate seminar courses numbered CHEM 250-259. Those numbered CHEM 260-289 are specifically excluded.

Normative Time to Degree 6 quarters

Doctoral Degree

The Department of Chemistry offers the Ph.D. degree in Chemistry.

The requirements are orientation examinations in analytical, inorganic, organic, and physical chemistry; general university requirements; and departmental requirements.

Program of Study

The departmental committee on graduate study determines a program of study on the

basis of the students' performance on the orientation examinations and a consideration of their subdisciplines. For students with a normal B.S. level preparation, the typical course pattern involves five courses selected from CHEM 200-249. If a student does not pass at least two of the four orientation exams, a sixth course selected from CHEM 200-249 will be required.

Professional Development Training

1. All students must take 1 quarter of CHEM 401 (Professional Development in Chemistry).
2. All students must take 1 quarter of CHEM 402 (Chemical Laboratory Safety).
3. Each quarter, all students in residence must enroll in:

   CHEM 250 (Graduate Seminar in Chemistry) and one from the following list based on the student's subdiscipline:

   CHEM 251 (Graduate Seminar in Analytical Chemistry)

   CHEM 252 (Graduate Seminar in Inorganic Chemistry)

   CHEM 253 (Graduate Seminar in Organic Chemistry)

   CHEM 254 (Graduate Seminar in Physical Chemistry)

Second Year Research Evaluation

Students seeking advancement to candidacy for the Ph.D. degree must undergo a Second-Year Research Evaluation (SYRE) by the end of the student's fourth quarter of residency. This examination consists in writing a proposal based on the student's dissertation research and defending it before a committee of faculty members. The SYRE is designed to test the student's development as a researcher and provide feedback to the student about the progress toward candidacy. A negative outcome on the SYRE notifies the student that significant improvements will be required to pass the qualifying exam, but it does not directly impact the student's academic standing.

Oral Qualifying Examination

This examination consists in part of defending an original proposition and is designed to test the extent of the candidates' development and their breadth of knowledge in chemistry and related fields.

Dissertation and Final Oral Examination

After completing the dissertation research, students must submit a written copy of the dissertation for approval by the student's dissertation committee. The dissertation research is then defended in a formal, public seminar presentation, followed by questioning of the candidate by the dissertation committee.

Modality for the Second-Year Research Evaluation, Oral Qualifying Exam, and Final Oral Examination

By default, the Second-Year Research Evaluation (SYRE), oral qualifying exam, and final oral examination will occur in an in-person format, with the student and all committee members physically present in the exam room. If one or more participants is unable to attend an in-person exam within the appropriate time frame, some or all participants may attend remotely via video conferencing software. The decision to adopt a remote or hybrid exam modality should be mutually agreed upon by the committee chair and the student, and the student must notify the Graduate Advisor of the change prior to the exam. If the exam participants cannot reach a consensus regarding the exam modality, the Graduate Advisor will arbitrate the modality.

Students must complete at least six quarters in residence in the UC with a GPA of 3.00 or better in all 100- and 200-level course work related to the degree.

Teaching Requirement

Normally requires three quarters of service as a teaching assistant, or equivalent.

Normative Time to Degree 15 quarters

Lower-Division Courses

CHEM 001 Preparation For General Chemistry 2 Lecture, 2 hours. Prerequisite(s): none. Provides problem-solving methods to succeed in general chemistry. Offered online only. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following CHEM 001 or CHEM 001W. Credit is not award to CHEM 001 if credit has been awarded to CHEM 002A.

CHEM 001A General Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 01LA; MATH 005A with a grade of C- or better or MATH 006A with a grade of C- or better or CHEM 001W with a grade of S or better or CHEM 001 with a grade of S or better or MATH 007A with a grade of C- or better or MATH 007B with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 009B with a grade of C- or better or MATH 006B with a grade of C- or better or MATH 009C with a grade of C- or better; or a score of 3, 4, or 5 on the College Board Advanced Placement Chemistry Examination or Advanced Placement Calculus Examination or a passing score on the California Chemistry Diagnostic Test or a score on the Mathematics Advisory Exam sufficient for placement in MATH 007A or MATH 009A. An introduction to the basic principles of chemistry. Instructional methods are either in-person lectures or virtual online lectures. Credit is awarded for one of the following CHEM 001A, CHEM 002A, or CHEM 01HA.

CHEM 001B General Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 01LB; CHEM 001A with a grade of C- or better, CHEM 01LA with a grade of C- or better or CHEM 01HA with a grade of C- or better, CHEM 1HLA with a grade of C- or better or CHEM 002A with a grade of C- or better, CHEM 02LA with a grade of C- or better. An introduction to the basic principles of chemistry. Provides lectures either in person or in a virtual online environment, depending on section offerings. Credit is awarded for one of the following CHEM 001B, CHEM 002B, or CHEM 01HB.

CHEM 001C General Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 01LC; CHEM 001B with a grade of C- or better or CHEM 01HB with a grade of C- or better; CHEM 01LB with a grade of C- or better or CHEM 1HLB with a grade of C- or better or CHEM 002B with a grade of C- or better, CHEM 02LB with a grade of C- or better. An introduction to the basic principles of chemistry. Provides lectures either in person or in a virtual online environment, depending on section offerings. Credit is awarded for one of the following CHEM 001C, CHEM 002C, or CHEM 01HC.

CHEM 01HA Honors General Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 1HLA; MATH 007A, may be taken concurrently or MATH 009A, may be taken concurrently or MATH 09HA, may be taken concurrently or MATH 007B or MATH 009B or MATH 09HB; or equivalent or a score of 4 or 5 on the College Board Advance Placement Chemistry Examination; a score of 600 or higher on the Mathematics portion of the SAT Reasoning Test or a score of 25 or higher on the ACT Mathematics Test; high school chemistry; or consent of instructor. Honors course corresponding to CHEM 001A. Covers the principles of chemistry in greater depth than in CHEM 001A. A limited enrollment course. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following CHEM 01HA, CHEM 001A, or CHEM 002A.

CHEM 01HB Honors General Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 1HLB; CHEM 001A with a grade of B or better or CHEM 01HA with a grade of B or better or CHEM 01LA with a grade of B or better or CHEM 1HLA with a grade of B or better or CHEM 002A with a grade of B or better or CHEM 02LA with a grade of B or better; admission to University Honors. Honors course corresponding to CHEM 001B. Covers the principles of chemistry in more depth than in CHEM 001B. A limited enrollment course. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following CHEM 01HB, CHEM 001B, or CHEM 002B.

CHEM 01HC Honors General Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 1HLC; CHEM 001B with a grade of B or better or CHEM 01HB with a grade of B or better or CHEM 002B with a grade of C- or better; CHEM 01LB or CHEM 1HLB or CHEM 02LB; admission to University Honors. Honors course corresponding to CHEM 001C. Covers the principles of chemistry in more depth than in CHEM 001C. A limited enrollment course. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following CHEM 01HC, CHEM 001C, or CHEM 002C.

CHEM 1HLA Honors General Chemistry Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 01HA; MATH 009A, may be taken concurrently or MATH 009B, may be taken concurrently or MATH 09HA, may be taken concurrently or MATH 007A, may be taken concurrently or MATH 007B, may be taken concurrently or MATH

009C, may be taken concurrently or CHEM 001 or CHEM 001W; admission to University Honors. Honors course corresponding to CHEM 01LA. An introduction to laboratory principles and techniques related to lecture topics in CHEM 01HA. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following CHEM 1HLA, CHEM 01LA, or CHEM 02LA.

CHEM 1HLB Honors General Chemistry Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 01HB; CHEM 001A with a grade of B or better, CHEM 01LA with a grade of B or better or CHEM 01HA with a grade of B or better, CHEM 1HLA with a grade of B or better or CHEM 002A with a grade of B or better, CHEM 02LA with a grade of B or better; admission to University Honors. Honors course corresponding to CHEM 01LB. An introduction to laboratory principles and techniques related to lecture topics in CHEM 01HB. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following CHEM 1HLB, CHEM 01LB, or CHEM 02LB.

CHEM 1HLC Honors General Chemistry Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 01HC; CHEM 001B with a grade of B or better or CHEM 01HB with a grade of B or better or CHEM 002B; CHEM 01LB or CHEM 1HLB or CHEM 02LB; admission to University Honors. Honors course corresponding to CHEM 01LC. An introduction to laboratory principles and techniques related to lecture topics in CHEM 01HC. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following CHEM 1HLC, CHEM 01LC, or CHEM 02LC.

CHEM 01LA General Chemistry Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 001A; MATH 005A with a grade of C- or better or MATH 006A with a grade of C- or better or CHEM 001W with a grade of S or better or CHEM 001 with a grade of S or better or MATH 007A with a grade of C- or better or MATH 007B with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 009B with a grade of C- or better or MATH 006B with a grade of C- or better or MATH 009C with a grade of C- or better; or a score of 3, 4, or 5 on the College Board Advanced Placement Chemistry Examination or Advanced Placement Calculus Examination or a passing score on the California Chemistry Diagnostic Test or a score on the Mathematics Advisory Exam sufficient for placement in MATH 007A or MATH 009A. An introduction to laboratory principles and techniques related to lecture topics in CHEM 001A. Credit is awarded for one of the following CHEM 01LA, CHEM 02LA, or CHEM 1HLA.

CHEM 01LB General Chemistry Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 001B; CHEM 001A with a grade of C- or better or CHEM 01HA with a grade of C- or better or CHEM 01LA with a grade of C- or better or CHEM 1HLA with a grade of C- or better or CHEM 002A with a grade of C- or better or CHEM 02LA with a grade of C- or better. An introduction to laboratory principles and techniques related to lecture topics in CHEM 001B. Credit is awarded for one of the following CHEM 01LB, CHEM 02LB, or CHEM 1HLB.

CHEM 01LC General Chemistry Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 001C; CHEM 001B with a grade of C- or better or CHEM 01HB with a grade of C- or better or CHEM 002B; CHEM 01LB or CHEM 1HLB or CHEM 02LB. An introduction to laboratory principles and techniques related to lecture topics in CHEM 001C. Credit is awarded for one of the following CHEM 01LC, CHEM 02LC, or CHEM 1HLC.

CHEM 001W Preparation For General Chemistry 3 Lecture, 2 hours; workshop, 3 hours. Prerequisite(s): MATH 005A, may be taken concurrently or MATH 006A, may be taken concurrently. Provides problem-solving methods to succeed in general chemistry. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to English 001C. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following CHEM 001W or CHEM 001. Credit is not award to CHEM 001W if credit has been awarded to CHEM 002A.

CHEM 002A General Chemistry For Chemistry Majors 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 02LA; MATH 005A with a grade of C- or better or MATH 006B with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 009B with a grade of C- or better or MATH 009C with a grade of C- or better or CHEM 001W with a grade of S or better; or a score of 3, 4, or 5 on the College Board Advanced Placement Chemistry Examination or Advanced Placement Calculus Examination or a passing score on the California Chemistry Diagnostic Test or a score on the Mathematics Advisory Exam sufficient for placement in MATH 009A.; restricted to major(s) Chemistry; or consent of instructor. An introduction to the basic principles of chemistry including atomic structure, quantum mechanics, molecular bonding, and stoichiometry. Designed for Chemistry majors. Credit is awarded for one of the following CHEM 002A, CHEM 001A, or CHEM 01HA.

CHEM 002B General Chemistry For Chemistry Majors 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 02LB; CHEM 002A with a grade of C- or better, CHEM 02LA with a grade of C- or better or CHEM 001A with a grade of C- or better, CHEM 01LA with a grade of C- or better or CHEM 01HA with a grade of C- or better, CHEM 01HLA with a grade of C- or better; restricted to major(s) Chemistry. An introduction to the basic principles of chemistry focusing on the properties of liquids and gases as well as thermodynamics and kinetics of chemical reactions. Credit is awarded for one of the following CHEM 002B, CHEM 001B, or CHEM 01HB.

CHEM 002C General Chemistry For Chemistry Majors 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 02LC; CHEM 002B with a grade of C- or better, CHEM 02LB with a grade of C- or better or CHEM 001B with a grade of C- or better, CHEM 01LB with a grade of C- or better or CHEM 01HB with a grade of C- or better, CHEM 01HLB with a grade of C- or better; restricted to major(s) Chemistry. An introduction to the basic principles of chemistry focusing on chemical equilibrium, acid-base reactions, electrochemistry, and metal complexes. Designed for Chemistry majors. Credit is awarded for one of the following CHEM 002C, CHEM 001C, or CHEM 01HC.

CHEM 02LA General Chemistry Laboratory For Chemistry Majors 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 002A; MATH 005A with a grade of C- or better or MATH 006B with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 009B with a grade of C- or better or MATH 009C with a grade of C- or better or CHEM 001W with a grade of S or better; or a score of 3, 4, or 5 on the College Board Advanced Placement Chemistry Examination or Advanced Placement Calculus Examination or a passing score on the California Chemistry Diagnostic Test or a score on the Mathematics Advisory Exam sufficient for placement in MATH 009A; restricted to major(s) Chemistry; or consent of instructor. An introduction to laboratory principles and techniques related to lecture topics in CHEM 002A. Credit is awarded for one of the following CHEM 02LA, CHEM 01LA, or CHEM 1HLA.

CHEM 02LB General Chemistry Laboratory For Chemistry Majors 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 002B; CHEM 002A with a grade of C- or better, CHEM 02LA with a grade of C- or better or CHEM 001A with a grade of C- or better, CHEM 01LA with a grade of C- or better or CHEM 01HA with a grade of C- or better, CHEM 01HLA with a grade of C- or better or CHEM 002B with a grade of C- or better; restricted to major(s) Chemistry. An introduction to laboratory principles and techniques related to lecture topics in CHEM 002B. Designed for Chemistry Majors. Credit is awarded for one of the following CHEM 02LB, CHEM 01LB, or CHEM 1HLB.

CHEM 02LC General Chemistry Laboratory For Chemistry Majors 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 002C; CHEM 002B with a grade of C- or better, CHEM 02LB with a grade of C- or better or CHEM 001C with a grade of C- or better, CHEM 01LC with a grade of C- or better or CHEM 01HC with a grade of C- or better, CHEM 01HLC with a grade of C- or better or CHEM 002C with a grade of C- or better; restricted to major(s) Chemistry. An introduction to laboratory principles and techniques related to lecture topics in CHEM 002C. Designed for chemistry majors. Credit is awarded for one of the following CHEM 02LC, CHEM 01LC, or CHEM 1HLC.

CHEM 003 Concepts of Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A survey of basic concepts of Chemistry. Designed for non-science majors and not as preparation for CHEM 001A or CHEM 01HA. Not open to students with credit for CHEM 001A or CHEM 01HA, but students who have completed CHEM 003 may take CHEM 001A or CHEM 01HA for full credit.

CHEM 005 Quantitative Analysis 5 Lecture, 3 hours; laboratory, 8 hours. Prerequisite(s): CHEM 001C with a grade of C- or better, CHEM 01LC with a grade of C- or better or CHEM 01HC with a grade of C- or better, CHEM 1HLC with a grade of C- or better or CHEM 002C with a grade of C- or better, CHEM 02LC with a grade of C- or better. Covers stoichiometric calculations and applications of principles of chemical equilibrium to analytical problems. Includes titrimetric and gravimetric laboratory procedures.

CHEM 008A Organic Chemistry 3 Lecture, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 08LA; CHEM 001C with a grade of C- or better, CHEM 01LC with a grade of C- or better or CHEM 01HC with a grade of C- or better, CHEM 1HLC with a grade of C- or better or CHEM 002C with a grade of C- or better, CHEM 02LC with a grade of C- or better. Covers modern organic chemistry including hydrocarbon structure and nomenclature, stereochemistry, and reaction mechanisms. Provides lectures either in person or in a virtual online environment, depending on section offerings. Credit is awarded for one of the following CHEM 008A or CHEM 08HA.

CHEM 008B Organic Chemistry 3 Lecture, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 08LB; CHEM 008A with a grade of C- or better, CHEM 08LA with a grade of C- or better or CHEM 08HA with a grade of C- or better, CHEM 08HLA with a grade of C- or better. Covers modern organic chemistry including structural determination via spectroscopic analysis, reactivity, reaction mechanisms, and multistep organic synthesis. Credit is awarded for one of the following CHEM 008B or CHEM 08HB.

CHEM 008C Organic Chemistry 3 Lecture, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 08LC; CHEM 008B with a grade of C- or better, CHEM 08LB with a grade of C- or better or CHEM 08HB with a grade of C- or better, CHEM 08HLB with a grade of C- or better. Covers modern organic chemistry and chemical biology including reactivity and synthesis. Also includes reaction mechanisms and the chemistry of carbohydrates, lipids, nucleic acids, amino acids, and proteins. Credit is awarded for one of the following CHEM 008C or CHEM 08HC.

CHEM 08HA Honors Organic Chemistry 3 Lecture, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 08HLA; CHEM 001C with a grade of B or better, CHEM 01LC with a grade of B or better or CHEM 01HC with a grade of B or better, CHEM 1HLC with a grade of B or better or CHEM 002C with a grade of B or better, CHEM 02LC with a grade of B or better; admission to University Honors; or consent of instructor. Honors course corresponding to CHEM 008A. Covers the principles of organic chemistry in greater depth than in CHEM 008A. Covers modern organic chemistry including hydrocarbon structure and nomenclature, stereochemistry, and reaction mechanisms. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following CHEM 08HA or CHEM 008A.

CHEM 08HB Honors Organic Chemistry 3 Lecture, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 08HLB; CHEM 008A with a grade of B or better, CHEM 08LA with a grade of B or better or CHEM 08HA with a grade of B or better, CHEM 08HLA with a grade of B or better; admission to University Honors; or consent of instructor. Honors course corresponding to CHEM 008B. Honors course that covers the principles of organic chemistry in greater depth than in CHEM 008B. Covers modern organic chemistry including structural determination via spectroscopic analysis, reactivity, reaction mechanisms and multistep organic synthesis. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following CHEM 08HB or CHEM 008B.

CHEM 08HC Honors Organic Chemistry 3 Lecture, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 08HLC; CHEM 008B with a grade of B or better, CHEM 08LB with a grade of B or better or CHEM 08HB with a grade of B or better, CHEM 08HLB with a grade of B or better; or consent of instructor. Honors course corresponding to CHEM 008C. Covers modern organic chemistry and chemical biology including reactivity, synthesis, and reaction mechanisms. Also includes the chemistry of carbohydrates, lipids, nucleic acids, amino acids, and proteins. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following CHEM 08HC or CHEM 008C.

CHEM 08HLA Honors Organic Chemistry Lab 1 Laboratory, 4 hours. Prerequisite(s): CHEM 001C with a grade of C- or better, CHEM 01LC with a grade of C- or better or CHEM 01HC with a grade of C- or better, CHEM 1HLC with a grade of C- or better or CHEM 002C with a grade of C- or better, CHEM 02LC with a grade of C- or better; admission to University Honors. Honors course corresponding to CHEM 08LA. An introduction to laboratory techniques of purification, isolation, synthesis, reactions, and spectroscopic analysis. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following CHEM 08HLA or CHEM 08LA.

CHEM 08HLB Honors Organic Chemistry Laboratory 1 Laboratory, 4 hours. Prerequisite(s): CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA with a grade of "B" or better or consent of instructor; concurrent enrollment in CHEM 08HB or a grade of "B" or better in CHEM 08HB. Honors course corresponding to CHEM 08LB in depth. An introduction to laboratory techniques of purification, isolation, synthesis, reactions, and spectroscopic analysis. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of CHEM 08LB or CHEM 08HLB.

CHEM 08HLC Honors Organic Chemistry Laboratory 1 Laboratory, 4 hours. Prerequisite(s): CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB with a grade of "B" or better or consent of instructor; concurrent enrollment in CHEM 08HC or a grade of "B" or better in CHEM 08HC. Honors course corresponding to CHEM 08LC in depth. An introduction to laboratory techniques of purification, isolation, synthesis, reactions, and spectroscopic analysis. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of CHEM 08LC or CHEM 08HLC.

CHEM 08LA Organic Chemistry Laboratory 1 Laboratory, 4 hours. Prerequisite(s): concurrent enrollment in CHEM 008A; CHEM 001C with a grade of C- or better, CHEM 01LC with a grade of C- or better or CHEM 01HC with a grade of C- or better, CHEM 1HLC with a grade of C- or better or CHEM 002C with a grade of C- or better, CHEM 02LC with a grade of C- or better. An introduction to laboratory techniques of purification, isolation, synthesis, reactions, and spectroscopic analysis. Credit is awarded for one of the following CHEM 08LA or CHEM 08HLA.

CHEM 08LB Organic Chemistry Laboratory 1 Laboratory, 4 hours. Prerequisite(s): CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA with grades of "C-" or better; concurrent enrollment in CHEM 008B or a grade of "C-" or better in CHEM 008B. An introduction to laboratory techniques of purification, isolation, synthesis, reactions, and spectroscopic analysis. Credit is awarded for only one of CHEM 08LB or CHEM 08HLB.

CHEM 08LC Organic Chemistry Laboratory 1 Laboratory, 4 hours. Prerequisite(s): CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB with grades of "C-" or better; concurrent enrollment in CHEM 008C or a grade of "C-" or better in CHEM 008C. An introduction to laboratory techniques of purification, isolation, synthesis, reactions, and spectroscopic analysis. Credit is awarded for only one of CHEM 08LC or CHEM 08HLC.

CHEM 093 Adventures in Chemistry: Careers, Research, Ethics and More 1 Discussion, 1 hour. Prerequisite(s): restricted to class level standing of freshman; restricted to major(s) Chemistry; or consent of instructor. An introduction to the Chemistry major and the avenues available to students who attain a Chemistry degree. Topics include chemical research, research ethics, career pathways, optimal study habits, and the application of chemistry in other fields such as the environment and materials science. Graded Satisfactory (S) or No Credit (NC).

CHEM 097H Freshman Honors Project: Introduction to Research 1 to 4 Research, 3 to 12 hours. Prerequisite(s): admission to University Honors. Prior arrangement with a chemistry faculty member is required An introduction to the methods of research in chemical sciences. The student conducts an investigation under the supervision of a

faculty member. A written report is required at the end of the quarter. To satisfy the requirement for the University Honors Program Freshman Project, the student must earn a minimum of 4 units during the first year. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable.

Upper-Division Courses

CHEM 109 Survey of Physical Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C with a grade of C- or better or CHEM 01HC with a grade of C- or better; CHEM 01LC with a grade of C- or better or CHEM 1HLC with a grade of C- or better; MATH 009B with a grade of C- or better or MATH 09HB with a grade of C- or better or MATH 007B with a grade of C- or better; or consent of instructor. Introduces thermodynamics, chemical equilibrium, kinetics, quantum chemistry, atomic and molecular structure, and spectroscopy. Primarily for majors in life and agricultural sciences; not recommended for Chemistry majors.

CHEM 110A Physical Chemistry: Chemical Thermodynamics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C with a grade of C- or better or CHEM 01HC with a grade of C- or better or CHEM 002C with a grade of C- or better; CHEM 01LC with a grade of C- or better or CHEM 1HLC with a grade of B or better or CHEM 02LC with a grade of C- or better; MATH 010A with a grade of C- or better, may be taken concurrently or MATH 009C with a grade of C- or better or MATH 09HC with a grade of C- or better; PHYS 002C with a grade of C- or better or PHYS 02HC with a grade of C- or better or PHYS 040C with a grade of C- or better, may be taken concurrently or PHYS 040HC with a grade of C- or better, may be taken concurrently; or consent of instructor. An introduction to thermodynamics, with applications to chemical systems.

CHEM 110B Physical Chemistry: Introduction to Statistical Mechanics and Kinetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 110A with a grade of "C-" or better or consent of instructor; prior or concurrent enrollment in MATH 010B is recommended. Statistical mechanics, kinetic molecular theory, and chemical kinetics with applications to chemical systems.

CHEM 111 Physical Chemistry Laboratory 4 Lecture, 2 hours; laboratory, 8 hours. Prerequisite(s): CHEM 110A and CHEM 110B with grades of "C-" or better (CHEM 110B may be taken concurrently), or consent of instructor. CHEM 113 recommended. Physical chemical measurements and laboratory experiments illustrating fundamental principles of physical chemistry. Modern electronic and optical measurement techniques.

CHEM 113 Physical Chemistry: Introduction to Quantum Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C with a grade of C- or better or CHEM 01HC with a grade of C- or better or CHEM 002C with a grade of C- or better; CHEM 01LC with a grade of C- or better or CHEM 1HLC with a grade of C- or better or CHEM 02LC with a grade of C- or better; MATH 009C with a grade of C- or better or MATH 09HC with a grade of C- or better; MATH 010A with a grade of C- or better, may be taken concurrently; PHYS 002C with a grade of C- or better, may be taken concurrently or PHYS 040C with a grade of C- or better, may be taken concurrently; or consent of instructor. Introduction to quantum mechanics with application to atomic and molecular structure and spectra.

CHEM 114 Advanced Physical Chemistry Laboratory 4 Lecture, 2 hours; laboratory, 8 hours. Prerequisite(s): CHEM 111 with a grade of "C-" or better or consent of instructor; completion of or concurrent enrollment in CHEM 113. Involves measurements and laboratory experiments illustrating applications of physical chemistry methods to problems in environmental, materials, and biological chemistry. Covers modern data acquisition, analysis, and computational techniques.

CHEM 125 Instrumental Methods 3 or 5 Lecture, 3 hours; laboratory, 8 hours. Prerequisite(s): CHEM 005 with a grade of C- or better; PHYS 002C, may be taken concurrently or PHYS 02HC, may be taken concurrently or PHYS 040C, may be taken concurrently or PHYS 040HC, may be taken concurrently; or consent of instructor. A capstone course consisting of lectures and experiments presenting contemporary instrumental methods and their use in chemistry. Graduate students may register for lecture only (3 units).

CHEM 135 Atmospheric Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB, or consent of instructor; ENSC 102 recommended. Structure of the troposphere and stratosphere; formation of atmospheric ozone; tropospheric NOx chemistry; methane oxidation cycle; phase distributions of chemicals; wet and dry deposition; chemistry of volatile organic compounds; formation of photochemical air pollution; modeling of air pollution and control strategies; stratospheric ozone depletion and global warming. Cross-listed with ENSC 135, and ENTX 135.

CHEM 136 Chemistry of Natural Waters 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 005 with a grade of "C-" or better or ENSC 101 with a grade of "C-" or better or consent of instructor. Introduction to processes controlling the chemical composition of natural waters. Topics include chemical equilibria, acid-base and coordination chemistry, oxidation-reduction reactions, precipitation-dissolution, air-water exchange, and use of equilibrium and kinetic models for describing marine nutrient, trace metal, and sediment chemistry. Cross-listed with ENSC 136.

CHEM 140 Environmental Chemistry Laboratory 4 Lecture, 2 hours; laboratory, 8 hours. Prerequisite(s): CHEM 125 with a grade of C- or better; CHEM 110A with a grade of C- or better or CHEM 109 with a grade of C- or better. Covers theory and application of chemical techniques for the analysis of environmentally relevant chemical processes. Discusses gas phase, condensed phase, surface, and particulate chemistry. Topics include "acid rain," photochemical smog, ozone depletion, and chemical analysis monitoring.

CHEM 141 Foundations of Chemistry Education Research 3 Lecture, 3 hours. Prerequisite(s): CHEM 005 with a grade of C- or better; or consent of instructor. Provides an overview of the theoretical frameworks of learning relevant to chemistry and the typical research methodologies used in chemistry education research. Includes a discussion of experimental design considerations and an introduction to quantitative data analysis. Credit is awarded for one of the following CHEM 141 or CHEM 241.

CHEM 143 Chemical Biology 3 Lecture, 3 hours. Prerequisite(s): CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC. Discusses biochemical reactions from a chemical standpoint and presents how the principles of chemistry have been applied to address fundamental questions in life sciences.

CHEM 150A Inorganic Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 008A with a grade of C- or better or CHEM 08HA with a grade of C- or better or CHEM 012A with a grade of C- or better or CHEM 12HA with a grade of C- or better; CHEM 08LA with a grade of C- or better or CHEM 8LHA with a grade of C- or better; CHEM 008B with a grade of C- or better or CHEM 08HB with a grade of C- or better or CHEM 012B with a grade of C- or better or CHEM 12HB with a grade of C- or better; CHEM 08LB with a grade of C- or better or CHEM 8LHB with a grade of C- or better. A systematic introduction to the synthesis, reactions, structure, and bonding of important classes of inorganic compounds. Emphasizes on non-transition metal chemistry.

CHEM 150B Inorganic Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 150A with a grade of "C-" or better. A systematic introduction to synthesis, reactions, structure, and bonding of important classes of inorganic compounds. Emphasis on transition metal chemistry.

CHEM 155 Advanced Inorganic Chemistry: Synthesis and Methods 4 Lecture, 2 hours; laboratory, 8 hours. Prerequisite(s): CHEM 150A with a grade of C- or better; restricted to major(s) Chemistry; or consent of instructor. Covers the synthesis, purification, and characterization of inorganic and organometallic compounds. Examples involve air-sensitive species in solution, as well as inorganic materials such as metal-organic frameworks and polymers. Techniques include inert atmosphere synthesis, crystal growth and X-ray diffraction, infrared and UV-vis spectroscopies, heteronuclear and variable temperature NMR, and cyclic voltammetry. Satisfactory(S) or No Credit(N/C) is not available.

CHEM 166 Advance Organic Chemistry: Synthesis and Methods 4 Lecture, 2 hours; laboratory, 8 hours. Prerequisite(s): BCH 162 with a grade of C- or better or CHEM 005 with a grade of C- or better; CHEM 008C with a grade of C- or better or CHEM 08HC with a grade of C- or better; CHEM 08LC with a grade of C- or better or CHEM 08HLC with a grade of C- or better; or consent of instructor. Covers advanced topics in organic chemistry, multi-step synthesis of bioactive molecules, new synthetic methods, and methods for the synthesis and characterization of complex organic compounds. Introduces synthetic techniques such as inert atmosphere synthesis with Schlenk lines. Includes hands-on use of spectroscopic methods for structural characterization.

CHEM 190 Special Studies 1 to 5 To be taken with the consent of the chair of the department as a means of meeting special curricular problems.

CHEM 191 Seminar in Chemistry Careers 1 Seminar, 1 hour. Prerequisite(s): upper-division standing. Oral reports and discussions by students, faculty, and visiting speakers. Required of chemistry majors; normally taken in the spring of the junior year. Graded Satisfactory (S) or No Credit (NC).

CHEM 197 Research For Undergraduates 1 to 4 Research, 1 to 4 hours. Prerequisite(s): sophomore or junior standing; consent of instructor. An introduction to the methods of research in chemistry. Includes a research project completed under the supervision of a Chemistry faculty member. Students who submit a written research report receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 6 units.

CHEM 198I Individual Internship 1 to 12 Internship, 2 to 24 hours; term paper or preparation for presentation, 1 to 12 hours. Prerequisite(s): upper-division standing in chemistry; consent of instructor. Industrial work experience coordinated and supervised by a chemistry faculty member and an off-campus sponsor. Requires a term paper or presentation. Course is repeatable to a maximum of 12 units.

CHEM 199 Senior Research 1 to 4 Research, 3 to 12 hours. Prerequisite(s): senior standing; consent of instructor. Research project completed under the supervision of a Chemistry faculty member. Students who submit a written research report receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Total credit for CHEM 199 and/or CHEM 199H may not exceed 9 units.

CHEM 199H Senior Honors Research 1 to 5 Research , 3 to 15 hours. Prerequisite(s): senior standing; consent of instructor; a minimum GPA of 3.00 in chemistry courses and in all university course work. Research in chemistry conducted under the supervision of a Chemistry faculty member. Students who submit a written research report receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Total credit for CHEM 199 and/or CHEM 199H may not exceed 9 units.

Graduate Courses

CHEM 201A Advanced Physical Chemistry: Quantum Mechanics 3 Lecture, 3 hours. Prerequisite(s): CHEM 113 with a grade of "C" or better. Covers concepts in quantum mechanics including wavepackets, uncertainty, single particles in multiple dimensions, and approximate methods for solving the Schroedinger equation.

CHEM 201B Advanced Physical Chemistry: Quantum Mechanics and Spectroscopy 3 Lecture, 3 hours. Prerequisite(s): CHEM 113 with a grade of "C" or better. Covers concepts in quantum mechanics with particular applications to spectroscopy.

CHEM 201C Advanced Physical Chemistry: Elementary Statistical Mechanics 3 Lecture, 3 hours. Prerequisite(s): CHEM 110A and CHEM 110B with grades of "C" or better. Covers concepts in elementary statistical mechanics including ensembles, interpretations of thermodynamic functions, and quantum statistics.

CHEM 201D Advanced Physical Chemistry: Thermodynamics 3 Lecture, 3 hours. Prerequisite(s): CHEM 110A and CHEM 110B with grades of "C" or better. Covers concepts in thermodynamics including fundamental equations, potentials, Maxwell relations, and stability criteria. Cross-listed with MSE 205.

CHEM 201E Advanced Physical Chemistry: Kinetics 3 Lecture, 3 hours. Prerequisite(s): CHEM 110A and CHEM 110B with grades of "C" or better. Covers concepts in kinetics including reaction mechanisms and the molecular interpretation of reaction dynamics.

CHEM 203 Nanoscience and Nanotechnology 3 Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry, Physics, Engineering, or a related subject or consent of instructor. Provides a condensed, interdisciplinary overview of selected fields of nanoscience and emerging nanotechnological applications. Focuses on applications relevant for the campus research community that are not based on electronic applications of silicon. Cross-listed with MSE 245C.

CHEM 206A Introduction to Computational Quantum Chemistry 3 Lecture, 3 hours. Prerequisite(s): CHEM 113 or equivalent, graduate standing; or consent of instructor. Introduces computational techniques in quantum chemistry. Includes Hartree-Fock theory, Density Functional Theory, and electron correlation methods. Emphasizes practical applications in a research setting. Cross-listed with MSE 225C.

CHEM 206B Modeling Chemical and Biochemical Molecules 3 Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry or a related field or consent of instructor. Introduces students to the principles, concepts, and techniques for modeling chemical and biological systems. Covers the various methods and techniques for molecular simulations, energy calculations, obtaining initial data, accessing data reliably, visualization and analysis of molecules, and screening and designing chemicals for proteins.

CHEM 207 Chemical Group Theory 3 Lecture, 3 hours. Prerequisite(s): consent of instructor. The principles of group theory and molecular symmetry. Applications in several areas of chemistry.

CHEM 208 Interdisciplinary Overview of Current Issues in Semiconductor Processing 3 Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry, Physics, Engineering, or a related subject or consent of instructor. An interdisciplinary overview of present-day semiconductor processing. Introduces topics such as properties of semiconductors, cleanroom environment, epitaxy, ion implantation, etching, lithography, device architecture, testing, and fault detection. May offer field trips. Cross-listed with PHYS 202, and MSE 245D.

CHEM 209 (E-Z) Advanced Topics in Physical Chemistry 2 to 3 Prerequisite(s): graduate standing. Selected advanced topics from modern physical chemistry.

CHEM 209M Magnetic Resonance 3 Lecture, 3 hours. Prerequisite(s): consent of instructor. Presents the quantum-mechanical theory and experiments of magnetic resonance. Topics include the spin-density operator formalism, multidimensional NMR, and solid-state NMR with examples chosen from chemistry, physics, biology, and medicine.

CHEM 209S Potential Surfaces 3 Lecture, 3 hours. Prerequisite(s): CHEM 201B or consent of instructor. This course concentrates on the spectroscopic methods for determining potential energy surfaces of molecules. Also discussed are the theoretical models that are used to interpret the experiments. The wave packet dynamics formalism will receive special attention.

CHEM 209W Laser Chemistry and Spectroscopy 3 Lecture, 3 hours. Prerequisite(s): consent of instructor. An introduction to laser spectroscopy and chemistry including the principles of laser operation and the use of lasers as spectroscopic tools. Topics will include absorption and emission of light, spectral lineshapes, coherent light sources, Doppler-limited and sub-Doppler high-resolution laser spectroscopy, time-resolved laser spectroscopy, Raman spectroscopy, chemical lasers and laser chemistry.

CHEM 209Y Nonlinear Coherent Spectroscopy 3 Lecture, 3 hours. Prerequisite(s): consent of instructor. Study of molecular spectroscopy and dynamics by the use of high intensity light. Also to be covered is the development of lasers as a means for generating intense coherent light.

CHEM 209Z Surface Chemistry 3 Lecture, 3 hours. Prerequisite(s): consent of instructor. This course will cover a description of the

main modern surface analytical techniques and their applications to practical problems, specially to catalysis.

CHEM 211A Structure and Mechanism in Organic Chemistry 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers structure and bonding in organic compounds emphasizing more advanced aspects of the field.

CHEM 211B Advanced Organic Chemistry: Reactions and Mechanism 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores organic and organometallic reaction mechanisms and their application to modern synthesis.

CHEM 211C Advanced Synthetic Analysis 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers synthetic organic chemistry emphasizing strategy, reactions, and techniques.

CHEM 211D Spectrometry in Organic Structure Analysis 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Utilizes modern spectroscopic techniques such as IR, mass spectrometry, and 1H and 13C NMR to determine the structure of complex organic molecules. Topics include advanced NMR techniques such as 2D NMR, NMR pulse sequences, diffusion NMR, and MRI. Cross-listed with MSE 225A.

CHEM 211E Advanced Organic Reactions 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers modern organic reactions and reagents and their mechanistic pathways with emphasis on recent developments and practical organic chemistry. Cross-listed with MSE 245A.

CHEM 216 Physical Organic Chemistry 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An advanced treatment of physical organic chemistry.

CHEM 217 Polymers: Synthesis and Characterization 3 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces fundamentals of polymer synthesis, types of polymers, stereo architectures, and applications. Explores modern methods of synthesis, emphasizing catalytic methods. Describes industrial synthetic methods. Examines polymer physics and characterization, emphasizing physical methods.

CHEM 221A Advanced Analytical Chemistry: Separation Science 3 Lecture, 3 hours. Prerequisite(s): CHEM 125; graduate standing; or consent of instructor. Provides an overview of modern analytical separations including theory, instrumentation, and applications.

CHEM 221B Advanced Analytical Chemistry: Optical Spectroscopy 3 Lecture, 3 hours. Prerequisite(s): CHEM 125; graduate standing; or consent of instructor. Provides an overview of modern analytical optical spectroscopic techniques including theory, instrumentation, and applications. Cross-listed with MSE 225B.

CHEM 221C Advanced Analytical Chemistry: Electrochemistry 3 Lecture, 3 hours. Prerequisite(s): CHEM 125; graduate standing. Provides an overview of modern electrochemistry including basic theory, applications, and instrumentation of potentiometry and amperometry.

CHEM 221D Advanced Analytical Chemistry: Mass Spectroscopy 3 Lecture, 3 hours. Prerequisite(s): CHEM 125; graduate standing. Provides an overview of modern mass spectroscopy including basic theory, instrumentation, and applications. Focuses on biological applications.

CHEM 221E Advanced Analytical Chemistry: Introduction to Bioanalytical Chemistry 3 Lecture, 3 hours. Prerequisite(s): CHEM 125; graduate standing. Covers important aspects of modern chemical measurements with particular emphasis on bioanalysis. Discusses analytical challenges associated with drug discovery and development including analysis of combinatorial libraries, high-throughput screening, metabonomics, genomics, and proteomics. Addresses new developments in analytical methods and instrumentation.

CHEM 221F Advanced Analytical Chemistry: Advanced Chemical Biology 3 Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry or a related field or consent of the instructor. Introduces synthetic and analytical methods that enable molecular control over and interrogation of proteins and nucleic acids in vitro, in cellulo, and in vivo. Includes emerging technologies for biomolecular labeling and regulation.

CHEM 222 Fundamentals of Heterogeneous Catalysis 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): CEE 204; graduate standing; or consent of instructor. Explores fundamental phenomenon of chemical reactivity on ground and excited state potential energy surfaces. Quantitatively relates electronic structure of catalytic materials to their chemical reactivity. Covers state-of-the-art experimental and theoretical approaches to studying catalytic reactivity. Provides a holistic understanding of catalysis at an atomic scale. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CEE 222, and MSE 239A.

CHEM 223 Nature of the Chemical Bond 3 Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry or a related field or consent of instructor. Explores all aspects of chemical bonding including molecular orbital theory, valence bond theory, and noncovalent bonding, with coverage of key concepts from all subdivisions of chemistry.

CHEM 229 (E-Z) Advanced Topics in Analytical Chemistry 2 Lecture, 2 hours. Prerequisite(s): graduate standing. Selected advanced topics from modern analytical chemistry. Course content will vary.

CHEM 229M Analysis of Atmospheric Chemicals 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers the fundamental chemistry of trace-level chemical pollutants' formation in the atmosphere and advanced methods and applications in analyzing these chemicals. We will comprehensively discuss techniques in air sample analysis for students to achieve a systematic and in-depth understanding of the principles and applications of these analytical techniques.

CHEM 229N Nanoscale Analyses 3 Lecture, 3 hours. Prerequisite(s): consent of instructor. Covers novel analytical instrumentation used to analyze ultrasmall (10-9 to 10-18 L) samples--for example, single molecules, individual cells and subcellular organelles, and dilute concentrations of biologically important molecules. Addresses applications, biological relevance, and instrumentation.

CHEM 229P Fourier Transform in Chemical Analysis 2 Lecture, 2 hours. Prerequisite(s): consent of instructor. Fundamentals of the discrete fast Fourier transform will be introduced. Applications of the technique to laboratory data processing including smoothing and deconvolution will be considered. Instrumentation, theory, and applications of Fourier transform infrared, nuclear magnetic resonance, and mass spectrometry are to be reviewed.

CHEM 229Q Nuclear Magnetic Resonance Spectrometry 3 Lecture, 3 hours. Prerequisite(s): consent of instructor. State-of-the-art nuclear magnetic resonance spectrometry will be covered, including a discussion of the principles of NMR and the techniques used to measure NMR spectra. The emphasis will be on Fourier transform NMR.

CHEM 229R Fourier Transform Infrared Spectrometry 3 Lecture, 3 hours. Prerequisite(s): consent of instructor. This course covers the theory of instrumentation of Fourier transform infrared (FT-IR) spectrometry, and its applications to such areas as kinetics, surface chemistry, quantitative and qualitative analysis of mixtures and biochemical systems.

CHEM 229S Mass Spectrometry 3 Lecture, 3 hours. Prerequisite(s): consent of instructor. This course will cover the theory of mass spectrometry, including instrumentation, interpretation, and applications.

CHEM 229T Luminescence Spectroscopy 3 Lecture, 3 hours. Prerequisite(s): CHEM 221B/MSE 225B; consent of instructor. Surveys static and dynamic luminescence measurements, measurements of polarized luminescence, the associated instrumentation, and several principal applications of luminescence spectroscopy.

CHEM 229U Chemometrics 3 Lecture, 3 hours. Prerequisite(s): consent of instructor. The development of mathematical statistical analysis and its application to univariate and higher-order chromatographic, spectroscopic, and electrochemical measurements.

CHEM 229W Environmental Analytical Chemistry 3 Lecture, 3 hours. Prerequisite(s): consent of instructor. Current techniques for the analysis of gas and particulate atmospheric samples. Applications to current environmental issues.

CHEM 229X Electrochemistry at Ultramicroelectrodes 3 Lecture, 3 hours. Prerequisite(s): consent of instructor. Analytical properties of electrodes of micrometer dimensions discussed. Special properties including mass transport, the effect of geometry, and current density at the electrode surface emphasized. Applications of these electrodes in resistive media, kinetic characterization of fast electron transfer reactions, and the effects of surface modification on electrode response highlighted.

CHEM 229Z Separation Science 3 Lecture, 3 hours. Prerequisite(s): CHEM 221A; consent of instructor. An in-depth treatment of the physical principles and practice of modern analytical separations. Emphasizes microscale separation techniques including capillary electrophoresis, capillary liquid chromatography, and micellar electrokinetic chromatography.

CHEM 231A Structure and Bonding in Inorganic Chemistry 3 Lecture, 3 hours. Prerequisite(s): CHEM 150A, CHEM 150B Covers advanced synthesis, structure, and bonding in inorganic, coordination, and organometallic chemistry. Cross-listed with MSE 245B.

CHEM 231B Reactivity and Mechanism in Inorganic and Organometallic Chemistry 3 Lecture, 3 hours. Prerequisite(s): CHEM 231A/MSE 245B. Covers advanced synthesis, reactivity, and mechanism in inorganic, coordination, and organometallic chemistry.

CHEM 231C Solid State and Materials in Inorganic Chemistry 3 Lecture, 3 hours. Prerequisite(s): CHEM 231A/MSE 245B; or consent of instructor. Covers the advanced synthesis, structure, bonding, and properties of inorganic materials. Cross-listed with MSE 235

CHEM 231D Experimental and Computational Solid State and Materials Chemistry 3 Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Covers various topics in the field of solid state and materials chemistry with a special emphasis on crystal structure determination, electronic properties, mechanical hardness and magnetism. Some exposure to basic inorganic and physical chemistry is required.

CHEM 231E Advanced Main Group Chemistry 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Chemistry; graduate standing; or consent of instructor. Covers modern main group chemistry focusing on synthesis and properties of compounds generated using the s- and p-block elements.

CHEM 231F Bioinorganic Chemistry 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Chemistry; graduate standing. Covers modern bioinorganic chemistry focusing on analysis and investigation of metalloproteins and biomimetic transition metal complexes.

CHEM 239 (E-Z) Adv Topics: Inorganic Chemstry 2 to 3 Prerequisite(s): graduate standing. Covers selected advanced topics in modern inorganic chemistry. The contents of the segments vary.

CHEM 239O Molecular Structure By Diffraction Methods 3 Lecture, 3 hours. Prerequisite(s): graduate standing; CHEM 211A or CHEM 231A/MSE 245B. Includes theory, practice, and hands-on determination of molecular structure via single-crystal X-ray structure and related methods.

CHEM 239S Theory and Molecular Modeling 3 Lecture, 3 hours. Prerequisite(s): graduate standing; CHEM 211A or CHEM 231A/MSE 245B. Covers applications of ab initio, density functional, and molecular modeling methods to chemistry.

CHEM 239T Fullerenes, Nanotubes, and Carbon-Based Materials 3 Lecture, 3 hours. Prerequisite(s): graduate standing; CHEM 211A or CHEM 231A/MSE 245B. Covers the chemistry, physics, and materials science of carbon-based molecules.

CHEM 239X Modern Applications of Transition Metals in Organic Synthesis 3 Lecture, 3 hours. Prerequisite(s): graduate standing; CHEM 211A or CHEM 231A/MSE 245B. Covers carbene complexes and their use in alkene metathesis, pi-arene complexes, palladium, samarium, and rare earths in organic synthesis and zirconium- and titanium-based reagents. Also discusses theoretical aspects of complexation.

CHEM 241 Foundations of Chemistry Education Research 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to major(s) Chemistry; graduate standing. Provides an overview of the theoretical frameworks of learning relevant to chemistry and the typical research methodologies used in chemistry education research. Includes a discussion of experimental design considerations and an introduction to quantitative data analysis. Credit is awarded for one of the following CHEM 241 or CHEM 141.

CHEM 242 Combinatorial Chemistry and Chemical Genomics 3 Lecture, 3 hours. Prerequisite(s): BIOL 102, CHEM 008C, or equivalents; a passing grade on the Chemistry Department organic orientation examination. Explores topics in chemical genomics. Part I involves combinatorial principles, library methods, solid-phase and split-pool synthesis, deconvolution, library design and informatics, and parallel synthesis. Part II involves screening and selection systems, forward and reverse chemical genetic approaches, phenocopies and epistasis, preparation and use of molecular arrays, and target identification. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CHEM 245 Chemistry and Physics of Aerosols 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 109, CHEM 110B; or consent of instructor. Fundamentals of chemical and physical processes controlling behavior and properties of airborne particles. Topics include particle mechanics; electrical, optical, and thermodynamic properties; nucleation; surface and aqueous-phase chemistry; gas-particle partitioning; sampling; size and chemical analysis; atmospheric aerosols; and environmental effects. Cross-listed with ENTX 245, and ENSC 245.

CHEM 246 Fate and Transport of Chemicals in the Environment 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): one year of organic chemistry; graduate standing; or consent of instructor. Covers identification of toxicants and their sources in the environment; equilibrium partitioning of chemicals between air, water, soil, sediment, and biota using physico-chemical properties; and the transport and transformations of chemicals in air, water, and soil media. Includes case studies of fate and transport of selected toxic chemicals. Cross-listed with ENSC 200, and ENTX 200.

CHEM 250 Graduate Seminar in Chemistry 1 Seminar, 1.5 hour. Prerequisite(s): graduate standing. Oral reports by graduate students, faculty, and visiting scholars on current research topics in chemistry. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CHEM 251 Graduate Seminar in Analytical Chemistry 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Includes oral reports and discussion by students, faculty, and visiting scholars from academia and industry on current research topics in analytical chemistry. Offered each quarter. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 252 Graduate Seminar in Inorganic Chemistry 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Includes oral reports and discussion by students, faculty, and visiting scholars from academia and industry on current research topics in inorganic chemistry. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 253 Graduate Seminar in Organic Chemistry 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Includes oral reports and discussion by students, faculty, and visiting scholars from academia and industry on current research topics in organic chemistry. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit

(NC) grade. Course is repeatable.

CHEM 254 Graduate Seminar in Physical Chemistry 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Includes oral reports and discussion by students, faculty, and visiting scholars from academia and industry on current research topics in physical chemistry. Offered each quarter. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 256 Chemistry of Nanostructured Materials 2 Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Explores the chemistry of nanostructured materials. Introduces nanotechnology, solid state chemistry and physics of nanomaterials, nanoscale characterization tools, lithography, micro- and nanofabrication, physical and chemical methods to nanomaterials, surface modification, sol-gel chemistry, self-assembly at various length scales, and bio-inspired materials. Emphasis is on development of novel functional nanostructured materials through chemical synthesis, surface modification, and self-assembly. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 258 Seminar in Surface Science 1 Seminar, 1 hour. Prerequisite(s): graduate standing in Physics or Chemistry or consent of instructor. Oral presentations by participating visiting scholars, postdoctoral researchers, students, and UCR faculty on current research topics in surface science. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Cross-listed with PHYS 258.

CHEM 259 Bioanalytical Chemistry 2 Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Explores bioanalytical separation and detection techniques. Topics include liquid chromatography, capillary electrophoresis, field flow fractionation, flow cytometry, multidimensional or multiplexed chromatography, microfluidics, mass spectrometry, biological sample preparation, and biosensors. Emphasis is on development of new bioanalytical techniques for detection of pathogens and study of pathogen-host interactions. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 260 Organic and Organometallic Methodology and Synthesis 2 Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Introduces key areas of synthetic organic and organometallic chemistry in a mechanism-based approach. Explores current literature with an emphasis on catalytic asymmetric reactions and their application to the synthesis of biologically active compounds. Surveys the background and history of discoveries leading to the development of new catalytic methodology. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 36 units.

CHEM 261 Scanning Probe Microscopy in Surface Science 2 Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Focuses on theory and applications of scanning probe microscopy in surface science, including the use of scanning tunneling microscopy to image surfaces on the atomic and molecular length scale, and scanning probe techniques to investigate and control elementary steps of surface reactions. Reviews surface crystallography, electronic, and phononic band structure. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 262 Ultrafast Dynamics in Condensed Matter 2 Seminar, 2 hours. Prerequisite(s): consent of instructor. The extremely fast relaxation and dephasing of nuclear (vibrational) and electronic excitations in condensed matter are probed by the use of coherent spectroscopy using (sub-picosecond) light pulses. Decay mechanisms are studied by making spectroscopic measurements at cryogenic temperatures (approximately 1K) and at various high pressures (greater than 100 Kbar). Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. May be repeated for credit.

CHEM 263 Analysis and Synthesis at the Chemistry-Biology Interface 2 Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Introduces key areas of bioanalytical chemistry and chemical biology. Explores current literature with an emphasis on protein engineering, fluorescence imaging, and synthesis of light-active compounds and their applications to the modulation of biological pathways. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 36 units.

CHEM 265 Raman Spectroscopy of Biological Systems 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Applications of Raman spectroscopy to the characterization of the structure and function of biological membranes and membrane proteins. Emphasis will be placed on resonance enhanced Raman scattering, including the theoretical origins of resonance enhancement. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 266 Molecular Recognition and Catalysis 2 Seminar, 2 hours., Prerequisite(s): graduate standing in Chemistry or consent of instructor. Explores topics in biological and organic chemistry relevant to the study of molecular recognition. Emphasizes the study of non-covalent forces in self-association and the properties of macromolecular constructs. Also involves the study of the synthetic organic and inorganic chemistry used to create these constructs. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. course is repeatable.

CHEM 267 Organic Electronic Materials 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. A study of design, synthesis, purification, manufacture, and application of carbon-based electronic materials. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with CEE 254.

CHEM 269 New Trends in Main Group Chemistry 2 Seminar, 2 hours. Prerequisite(s): senior or graduate standing in Chemistry or consent of instructor. Training in modern main group chemistry, covering boron, silicon, phosphorous, and related elements. Organic and inorganic chemists benefit from this course. Introduces students to the peculiar properties of these elements, thus enabling them to use this knowledge in their own field of expertise. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 270 Theoretical Quantum Chemistry: Methods and Applications 2 Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Explores topics in computational quantum chemistry relevant to both wave function and density functional theories. Emphasizes new computational algorithms and physical approximations that can be used to accelerate calculations and the applications of these methods to solve chemical problems. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 271 Design, Synthesis, and Applications of Highly Conjugated Organic Systems 2 Seminar, 2 hours., Prerequisite(s): graduate standing or consent of instructor. Focuses on the design and synthesis of highly conjugated organic molecules and polymers for application in molecule-based devices such as sensors, light emitting diodes, and conductors. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 272 Gaseous Ion Chemistry 2 Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Surveys all aspects of ion chemistry in the gas phase. Topics include mass spectrometry, ion mobility, electrospray ionization, matrix-assisted laser desorption ionization, ion-molecule reactions, ion-ion reactions, quantum calculations, instrumentation, and photodissociation spectroscopy. Emphasis is on bioanalytical

applications for the study of protein structure, folding, and assembly. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 273 Bioanalytical Nuclear Magnetic Resonance Spectroscopy 2 Seminar, 2 hours. Prerequisite(s): consent of instructor. Development of Pulse Fourier transform NMR techniques and their application to the characterization of peptides, proteins and intact cells. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. May be repeated for credit.

CHEM 274 Chemical Biology 2 Seminar, 2 hours. Prerequisite(s): senior or graduate standing in Chemistry or consent of instructor. Involves formal presentations by graduate students on topics in the current literature and their research. Presentation responsibilities rotate among enrolled students and postdoctoral fellows. Also entails team work on problem sets and oral presentation of solutions. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 275 Bioorganic Chemistry of Nucleic Acids 2 Seminar, 2 hours. Prerequisite(s): consent of instructor. The design, synthesis, and evaluation of nucleotides with novel hydrogen-bonding capabilities as well as oligonucleotides capable of regulating gene expression. Discussion of ribonucleic acid catalysis, including possible catalytic functions that have not yet been determined. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 276 The Nanocrystal-Ligand Interface 2 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Explores the nanocrystal-ligand interface. Topics include a quantitative understanding of the nanocrystal-ligand interface, single molecule spectroscopic methods; the self-assembly of nanoparticles; supramolecular chemistry; synthesis and characterization of organic-inorganic hybrid nanostructures; and nanostructures with novel catalytic and optoelectronic properties. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 36 units.

CHEM 277 Surface Chemistry 2 Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussions for new advances in surface science, concentrating mainly on the use of molecular level. Letter grades will be assigned to students who present a paper; others will be graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

CHEM 278 Nuclear Magnetic Resonance: Theory, Techniques, and Applications 2 Seminar, 2 hours., Prerequisite(s): graduate standing or consent of instructor. Focuses on the development of solid-state and liquid-state nuclear magnetic resonance (NMR) as a probe of molecular structure, function, and dynamics with applications that range from chemistry to physics and biology. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade based on seminar participation. Course is repeatable.

CHEM 279 Molecular Spectroscopy 2 Seminar, 2 hours. Prerequisite(s): consent of instructor. Properties of excited states of molecules. Molecular photophysics and photochemistry. Theory of radiationless transitions. Kinetics and mechanism of excited state decay. Laser spectroscopy. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. May be repeated for credit.

CHEM 280 Chemistry and Biochemistry of Gaseous Molecules 2 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): consent of instructor. Reactions and properties of organic compounds and ions in the absence of bulk media. Preparative mass spectrometry and ion-molecule reactions. Molecular mechanisms in the sense of smell. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. May be repeated for credit.

CHEM 282 Elementary Processes in Atmospheric Chemistry 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Applies state-of-the-art laser techniques to investigate elementary processes in atmospheric chemistry. Emphasis is quantitative understandings of atmospheric free-radical intermediates, their photochemistry, and their reaction mechanisms. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 283 Development of Inorganic Solid State Materials 2 Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Focuses on the development of advanced materials such as optical, electronic, and porous materials. Topics include synthetic methods, characterization techniques, property measurements, and device applications. Special emphasis is placed on the design of synthetic strategies for the discovery of new functional materials with novel properties. Course is repeatable.

CHEM 284 Biological Mass Spectrometry 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. A study of the synthesis, purification, and mass spectrometric characterization of biomolecules, nucleic acids in particular. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 285 Bio-Inspired Materials and Chemical Sensors 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. A study of biomaterials and their application in analytical chemistry. Focus is on the design and synthesis of new materials, electrochemical detection, and the Surface Plasmon Resonance (SPR) technique. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 286 Time-Resolved Spectroscopy and Microscopy and Dynamics in Complex Systems 2 Seminar, 2 hours. Prerequisite(s): senior or graduate standing in Chemistry or consent of instructor. A comprehensive survey of modern time-resolved spectroscopy and microscopy techniques. Emphasizes applications to outstanding problems in materials science and biology. Specific problems include the measurement of energy transport in organic semiconductors and DNA dynamics in biological media. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 287 Modeling Molecular Recognition 2 Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry or consent of instructor. Focuses on molecular recognition and systems-level simulations, addressing theory and applications. Includes statistical mechanics (as applied to the prediction of equilibrium and nonequilibrium properties of chemical and biological systems), drug design and discovery, and cheminformatics. Utilizes numerical analysis, molecular dynamics and Brownian dynamics simulations, docking and scoring programs, and chemical database tools. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 288 Bioanalytical Applications of Nuclear Magnetic Resonance (nmr) and Mass Spectrometry (ms) 2 Seminar, 2 hours. Prerequisite(s): consent of instructor. Focuses on the study of ligand-protein interactions, metabonomics, with special emphasis on the application of hyphenated NMR and MS experiments. Also discusses new NMR pulse sequences and microcoil probes. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 289 Special Topics in Neuroscience 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussion of selected topics in neuroscience. Content and instructor(s) vary each time course is offered. Students who present a seminar receive a letter grade; other students

receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with BCH 289, BIOL 289, ENTM 289, NRSC 289, and PSYC 289.

CHEM 296 Special Topics Seminar 2 Seminar, 2 hours. Prerequisite(s): graduate standing in Chemistry; or consent of instructor Includes oral presentations and intensive small-group discussion of selected topics in the area of specialization of each faculty member. Emphasizes recent advances in the special topic area; course content varies accordingly. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 297 Directed Research 1 to 6 Prerequisite(s): consent of a staff member. Research in analytical, inorganic, organic, or physical chemistry under the direction of a member of the staff. A written report is required of the research study. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CHEM 299 Research For Thesis Or Dissertation 1 to 12 Prerequisite(s): consent of a staff member. Research in analytical, inorganic, organic, or physical chemistry under the direction of a member of the staff. This research is to be included as part of the dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

CHEM 301 Oral Presentations in Chemistry 1 Lecture, 1 hour. The technique of oral presentation, emphasizing the problems that arise in chemistry laboratory and classroom situations. Designed primarily for new graduate students in the Chemistry Department. Graded Satisfactory (S) or No Credit (NC).

CHEM 302 Teaching Practicum 1 to 2 Lecture/laboratory, 4 to 8 hours. Prerequisite(s): Limited to Chemistry Department teaching assistants and Associates-In Chemistry. Supervised teaching in undergraduate courses in Chemistry. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit. Units are not applicable to degree unit requirements.

CHEM 401 Professional Development in Chemistry 1 Lecture, 1 hour. Prerequisite(s): graduate standing in Chemistry. Provides skill development and theory in writing, public speaking, and pedagogy related to chemical science. Designed primarily for new graduate students in the Chemistry Department. Graded Satisfactory (S) or No Credit (NC).

CHEM 402 Chemical Laboratory Safety 1 Seminar, 1 hour. Prerequisite(s): graduate standing. Covers safety issues surrounding research and teaching in chemical laboratories. Topics include safe handling of chemicals, radioactive materials, and biological samples; laboratory equipment hazards; proper use of personal protective equipment; and emergency response procedures. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CHEM 402 Chemical Laboratory Safety 1 Seminar, 1 hour. Prerequisite(s): graduate standing. Covers safety issues surrounding research and teaching in chemical laboratories. Topics include safe handling of chemicals, radioactive materials, and biological samples; laboratory equipment hazards; proper use of personal protective equipment; and emergency response procedures. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Chemistry Education Designated Emphasis

College of Natural and Agricultural Sciences

Jack Eichler (Chemistry), Director
jack.eichler@ucr.edu

Advisory Committee & Participating Faculty

Ana Bahamonde (Chemistry)
Christopher J. Bardeen (Chemistry)
Ludwig Bartels (Chemistry)
Gregory J.O. Beran (Chemistry)
Trevor Buldoc, Ph.D. (Chemistry)
Matthew Casselman (Chemistry)
Chia-En A. Chang (Chemistry)
Quan "Jason" Cheng (Chemistry)
Matthew Conley (Chemistry)
Emma Danelius, Ph.D. (Chemistry)
James Davies (Chemistry)
Pingyun Feng (Chemistry)
Boniface Fokwa (Chemistry)
Joseph Genereux (Chemistry)
W. Hill Harman (Chemistry)
Joshua Hartman (Chemistry)
Richard Hooley (Chemistry)
Ryan Julian (Chemistry)
Kevin Kou (Chemistry)
Catharine Larsen (Chemistry)
Vincent Lavallo (Chemistry)
Samuel Mann (Chemistry)
Leonard J. Mueller (Chemistry)
William Neary (Chemistry)
Michael Pirrung (Chemistry)
Richard Schrock (Chemistry)
Timothy Su (Chemistry)
Christopher Y. Switzer (Chemistry)
Kathryn Uhrich (Chemistry)
Yinsheng Wang (Chemistry)
Yadong Yin (Chemistry)
Francisco Zaera (Chemistry)
Haofei Zhang (Chemistry)
Jingsong Zhang (Chemistry)
Linlin Zhao (Chemistry)

Designated Emphasis Requirements

The Designated Emphasis in Chemistry Education is a course of study intended to give students a background in designing and carrying out an educational research study in the context of higher education chemistry teaching and learning. The program is optional and the courses used for the DE may not be counted toward MS or PhD requirements. The Designated Emphasis in Chemistry Education has two core requirements:

1. **Completion of three (3) graduate courses (12 units), with one (1) graduate course being in Chemistry Education and two (2) graduate courses in Psychology:**
   a) CHEM 241 **(4 units)**
   b) PSYC 211 **(4 units)**
   c) Either PSYC 212 **(4 units)** or PSYC 207C **(3 units)**
2. **Completion of a chemistry education research project anytime after the student advances to candidacy.** The scope of this project is expected to be such that it comprises one chapter in the final PhD dissertation. This project may be completed under the guidance of a chemistry department professor of teaching (who would act as a co-advisor overseeing the chemistry education research), or could be completed independently under the approval of the Chemistry Education DE Program Committee and the student's research advisor. CHEM 299 **(4 units)**.

The Chicano Bilingual-Bicultural Studies Minor

College of Humanities, Arts, and Social Sciences

Adalberto Aguirre, Jr., Ph.D., Chair
Office, 1140 Watkins Hall
(951) 827-5507

Committee in Charge

Covadonga Lamar Prieto (Hispanic Studies)
Daryle Williams, Dean, *ex officio*

Professor Emeritus

Philip Gericke (Spanish & Portuguese)

The Chicano Bilingual-Bicultural Studies minor provides the student with a basic understanding of the Spanish language and of the Mexican American bicultural contexts in which that language is used in the southwestern United States.

1. **Lower-division requirements (8 units)**
   a) Four (4) units from ETST 002, ETST 004/HIST 004
   b) Four (4) units from one of the following:
      (1) SPN 006
      (2) Any upper-division course taught in Spanish language
2. **Upper-division requirements (16 units)**
   a) One course in the general area of Education and Bilingualism from ETST 146/EDUC 146, ETST 163/SOC 163, ETST 165/SOC 165, ETST 166
   b) One course from the general area of Societal Perspectives on the Chicano Experience ETST 142
   c) One course from ETST 123, ETST 124, ETST 126, ETST 128/SOC 128
   d) One course in Chicano Art or Literature from ETST 108P, ETST 114, ETST 153/LNST 153, ETST 191N

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Comparative Literature and Languages

College of Humanities, Arts, and Social Sciences

Jeffrey Sacks, Ph.D., Chair
Anne McKnight, Ph.D., Vice Chair
Department Office, 2402 Humanities and Social Sciences
(951) 827-1462; complitlang.ucr.edu

Professors

Michelle E. Bloom, Ph.D. *Comparative Literature/French*
Anthonia Kalu, Ph.D. African *Literature and Culture/Comparative Literature*
Yenna Wu, Ph.D. *Chinese/Civilizations/ Comparative Literature*
Jeffrey Sacks, Ph.D. *Comparative Literature/Arabic*

Associate Professors

Heidi Brevik-Zender, Ph.D. *French/ Comparative Literature*
Kelly Jeong, Ph.D. Korean *Literature and Culture/ Comparative Literature*
John N. Kim, Ph.D. *German/Japanese/ Comparative Literature*
Mariam Beevi Lam, Ph.D. *Comparative Literature/Vietnamese*
Anne McKnight, Ph.D. *Japanese/ Comparative Literature*
Vrinda Chidambaram, Ph.D. *Linguistics*

Assistant Professors

Kyle Khellaf, Ph.D. *Classics/Comparative Literature*
Erin Lam, Ph.D. *Classics/Comparative Literature*
Trisha Remetir, Ph.D. *Comparative Literature/Southeast Asian Studies*

Assistant Professors of Teaching

Emily Graham, Ph.D., *Linguistics*

Senior Lecturers

Christine Duvergé, Ph.D. *French*
Young Hong, Ph.D. *Korean*
Priscilla Ruedas, M.A. *Filipino*
Shuliang Hsu, M.A. *Chinese*
Benjamin King, Ph.D. *Classics*
Jennifer Ramos, M.A. *French*
Kyoko Sagawa, M.A. *Japanese*
Sabine Thuerwaechter, Ph.D. *German/ Comparative Literature*
Heidi Waltz, Ph.D. *Linguistics/Germanic Studies*
Ekaterina Yudina, Ph.D. *Russian*
Reiko Sato, M.A. *Japanese*

Lecturers

Nicoletta Da Ros, M.A. *Italian*
Yasuhiko Miura, Ph.D. *Japanese*
Huda Aljord, M.A. *Arabic*

Professors Emeriti

David K. Danow, Ph.D. *Russian/Comparative Literature*
Robert B. Griffin, Ph.D. *Comparative Literature/ French*
Georg M. Gugelberger, Ph.D. *Comparative Literature*
Stephanie B. Hammer, Ph.D. *Germanic Studies/ Comparative Literature*
Jules F. Levin, Ph.D. *Linguistics/Russian*
Eliud Martínez, Ph.D. *Comparative Literature (Comparative Literature and Languages/ Creative Writing)*
Hendrik M.J. Maier, Ph.D. *Literature of Southeast Asia and Indonesia*
Lisa A. Raphals, Ph.D. *Distinguished Professor Chinese/Comparative Literature*
Thomas F. Scanlon, Ph.D. *Classics/ Comparative Ancient Civilizations/ Comparative Literature*
Ben F. Stoltzfus, Ph.D. *Litt.D. Comparative Literature/ French (Comparative Literature and Languages/ Creative Writing)*
Eugene Perry Link, Ph.D., *Chancellorial Chair for Teaching Across Disciplines, Chinese Literature, Language and Culture*

Associate Professors Emeriti

Yang Ye, Ph.D. *Comparative Literature/Chinese*

Lecturers Emeriti

Wendy J. Raschke, Ph.D. *Classics/Comparative Literature/Comparative Ancient Civilizations*

Majors

The Department of Comparative Literature and Languages offers courses and degree programs in Western and non-Western national literatures, languages, and civilizations. It also has programs in Comparative Literature, Comparative Ancient Civilizations, and Linguistics. The department believes in the importance of offering fundamental training in the humanities in their own literary and linguistic contexts as well as in their cultural and interdisciplinary dimensions. Accordingly, students may obtain degrees or take courses in a specialized field, while at the same time enhancing the breadth of their education within and outside of the department.

The department offers the following majors leading to the B.A. degree.

Chinese and Japanese

The B.A. degrees in Languages and Literatures/ Chinese and Languages and Literatures/ Japanese offer a diverse, flexible program for students interested in the study of Asian languages, cultures, and literatures.

Classical Studies

The B.A. in Languages and Literatures/Classical Studies combines the study of Greek and/or Latin language and literature with courses which explore the historical, philosophical, political, and cultural developments of Greece and Rome and their impact on Western civilization. The department is a joint member of the UC Tri-Campus Graduate Program in Classics (UCI, UCR, UCSD), which offers M.A. and Ph.D. degrees in Classics.

Comparative Ancient Civilizations

For the B.A. in Languages and Literatures/ Comparative Ancient Civilizations, students employ the methods of humanities and social sciences in the comparison study of several major cultures of the past. They acquire skills of historical and social analysis, multicultural awareness, and insight into constructions of civilizations in general.

Comparative Literature

The department offers the B.A. degree in Languages and Literatures/Comparative Literature and the M.A. and Ph.D. graduate degrees in Comparative Literature.

While students majoring in Languages and Literatures/ Comparative Literature must have a knowledge of the languages involved in the literatures of their choice, Comparative Literature courses themselves are open to all students. All work is done in translation and the courses are given in English.

French, Germanic Studies, and Russian Studies

The B.A. degree is offered in Languages and Literatures/French, Languages and Literatures/Germanic Studies, and Languages and Literatures/Russian Studies. Requirements for degrees include proficiency in the language of the literature.

Languages

The Languages and Literatures/Languages major allows a student to specialize in two foreign languages through a knowledge not only of the languages themselves but also of the bases of language (linguistics), examples of their creative use (literature), and the cultures which they reflect (civilization).

Linguistics

A B.A. in Linguistics is available through a program administered by an interdepartmental committee. Some foreign language study is essential for specialization in this discipline, as well as the pursuit of research projects and other kinds of practical work in linguistic-related areas.

Graduate Degrees

Comparative Literature (interliterary) M.A.

Comparative Literature (interliterary or interdisciplinary) Ph.D.

UC Tri-Campus Graduate Program in Classics M.A. and Ph.D.

Teaching Assistantships and Fellowships

Teaching assistantships and fellowships are available. Teaching assistants are normally held for CPLT 301 (Teaching of Foreign Language at the College Level). Course work and/ or teaching experience at another college-level institution may be accepted in fulfillment of this requirement.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational

Opportunities section in the beginning of this catalog.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

Requirements for the majors and courses offered are described in the following sections.

Arabic Language

Arabic Literatures and Cultures

Civilization

Comparative and World Literature

Languages and Literatures/Comparative Literature

Italian Studies

Chinese

Classical Studies

Classics

Greek

Latin

Comparative Ancient Civilizations

French

Germanic Studies

Japanese

Languages

Russian Studies

Linguistics

Literatures and Languages

Minors

Minor programs offered in the Department of Comparative Literature and Languages are:

Arabic

Chinese

Classical Studies

French

Germanic Studies

Italian Studies

Japanese

Korean

Russian Studies

Southeast Asian

Arabic Minor

This minor introduces the field of Arabic studies, and offers training in the Arabic language and in the close reading of texts— including poetry, literature, philosophy, theoretical writings, essays, and film—with attention to problems of translation, the history of disciplines, and the formation of institutions. It teaches students to read cultural objects, practices, texts, and institutions as active sites of translation, negotiation, contestation, and invention.

Minor Requirements

1. Lower Division Requirements (language proficiency)

a) ARBC 001, 002, 003, and 004

2. Upper Division Requirements (16 units)

a) Twelve upper-division units in Arabic Literature and Culture from ARLC 120, ARLC 151/CPLT 151/MEIS 151, ARLC 152/CPLT 152, ARLC 154/CPLT 154/PHIL 128, ARLC 155/CPLT 155/MEIS 155, ARLC 156/CPLT 156/MEIS 156/RLST 156, and any other related courses chosen in consultation with the student's faculty advisor.

b) Four upper-division units from CPLT 110 or a related upper-division course

Arabic Language

Foreign Language Placement Examination
A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course cannot take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

Lower-Division Courses

ARBC 001 Elementary Arabic 4 Lecture, 4 hours. Prerequisite(s): Student must take the Arabic placement examination. An introduction to modern standard Arabic. Focuses on the development of the four language skills: listening, speaking, reading, and writing. Also explores aspects of Arabic cultures. Classes conducted primarily in Arabic.

ARBC 002 Elementary Arabic 4 Lecture, 4 hours. Prerequisite(s): ARBC 001 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to modern standard Arabic. Focuses on the development of the four language skills: listening, speaking, reading, and writing. Also explores aspects of Arabic cultures. Classes conducted primarily in Arabic.

ARBC 003 Elementary Arabic 4 Lecture, 4 hours. Prerequisite(s): ARBC 002 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to modern standard Arabic. Focuses on the development of the four language skills: listening, speaking, reading, and writing. Also explores aspects of Arabic cultures. Classes conducted primarily in Arabic.

ARBC 004 Intermediate Arabic 4 Lecture, 4 hours. Prerequisite(s): ARBC 003 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to intermediate modern standard Arabic. Builds upon current knowledge levels of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Classes conducted in Arabic.

ARBC 005 Intermediate Arabic 4 Lecture, 4 hours. Prerequisite(s): ARBC 004 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to intermediate modern standard Arabic. Builds upon current knowledge levels of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Classes conducted in Arabic.

ARBC 006 Intermediate Arabic 4 Lecture, 4 hours. Prerequisite(s): ARBC 005 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to intermediate modern standard Arabic. Builds upon current knowledge levels of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Classes conducted in Arabic.

Upper-Division Courses

ARBC 101A Advanced Arabic 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ARBC 006 or equivalent. An introduction to advanced modern standard Arabic. Builds upon knowledge of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Class conducted in Arabic.

ARBC 101B Advanced Arabic 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ARBC 101A or equivalent. An introduction to advanced modern standard Arabic. Builds upon knowledge of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Class conducted in Arabic.

ARBC 101C Advanced Arabic 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ARBC 101B or equivalent. An introduction to advanced modern standard Arabic. Builds upon knowledge of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Class conducted in Arabic.

ARBC 105 Media Arabic 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ARBC 006 or consent of instructor. Develops listening, speaking, reading, and writing

skills through a focus on the language in newspapers, the news, and other forms of media in the Arabic language.

ARBC 110 Advanced Readings in Arabic 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ARBC 006 or consent of instructor. Advanced seminar in the reading of Arabic texts. Focuses on improving students' reading skills while reviewing and deepening knowledge of Arabic grammar and vocabulary. Course is repeatable as content changes up to a maximum of 12 units.

ARLC 120 Classical Arabic Literary Prose 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores aspects of classical Arabic literary prose. Includes the modes of quotation, citation, falsification, fabrication, and forgery. Focuses upon selected writings of al-Hamadhai, al-Jahiz, al-Ma'arri, Ibn Tufayl, and Ibn Hazim.

ARLC 151 Palestine/Algeria 4 Lecture, 3 hours; screening 6 hours per quarter; extra reading, 24 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Considers two distinct and related literary and historical moments: Palestine and Algeria. Topics include the relations between language and context; literature and literary historiography; genre and idiom; violence and the body; and the state and institutional practices of reading. Cross-listed with CPLT 151, and MEIS 151.

ARLC 152 Modern Arabic Poetry in A Multilingual Frame 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers selected writings of Adunis ('Ali Ahmed Sa'id), Mahmoud Darwish, Abdelatif La'abi, and Etel Adnan, published originally in Arabic, French, and English. Topics include language (idiom, statement, utterance, translation, repetition, rhythm) and history (loss, violence, mourning, inheritance, future, legacy). Course is taught in English. Cross-listed with CPLT 152.

ARLC 154 Introduction to Arabic Philosophy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Arabic philosophical texts. Provides close and literary reading of texts in philosophy, as well as considers the impact these texts have had or can have on Western cultural formation. Cross-listed with CPLT 154, and PHIL 128.

ARLC 155 Introduction to Arabic Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to Arabic literature that focuses on language and rhetoric. Considers major issues such as colonialism, secularism, modernity, language, and the state. Utilizes texts from literature, law, and philosophy. Cross-listed with CPLT 155, and MEIS 155.

ARLC 156 Jews and Arabs 4 Lecture, 3 hours; extra reading, 3 hours Prerequisite(s): upper-division standing or consent of instructor. Traces the formation of the shared and divided history of the Jewish and Arab peoples. Focuses on the literary and institutional dimensions of this history, as well as the formation of related areas of study, such as religion, philosophy, literature, and psychoanalysis. Cross-listed with CPLT 156, MEIS 156, and RLST 156.

Arabic Literatures and Cultures

Lower-Division Courses

ARBC 001 Elementary Arabic 4 Lecture, 4 hours. Prerequisite(s): Student must take the Arabic placement examination. An introduction to modern standard Arabic. Focuses on the development of the four language skills: listening, speaking, reading, and writing. Also explores aspects of Arabic cultures. Classes conducted primarily in Arabic.

ARBC 002 Elementary Arabic 4 Lecture, 4 hours. Prerequisite(s): ARBC 001 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to modern standard Arabic. Focuses on the development of the four language skills: listening, speaking, reading, and writing. Also explores aspects of Arabic cultures. Classes conducted primarily in Arabic.

ARBC 003 Elementary Arabic 4 Lecture, 4 hours. Prerequisite(s): ARBC 002 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to modern standard Arabic. Focuses on the development of the four language skills: listening, speaking, reading, and writing. Also explores aspects of Arabic cultures. Classes conducted primarily in Arabic.

ARBC 004 Intermediate Arabic 4 Lecture, 4 hours. Prerequisite(s): ARBC 003 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to intermediate modern standard Arabic. Builds upon current knowledge levels of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Classes conducted in Arabic.

ARBC 005 Intermediate Arabic 4 Lecture, 4 hours. Prerequisite(s): ARBC 004 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to intermediate modern standard Arabic. Builds upon current knowledge levels of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Classes conducted in Arabic.

ARBC 006 Intermediate Arabic 4 Lecture, 4 hours. Prerequisite(s): ARBC 005 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Arabic placement examination as determined by the department faculty. An introduction to intermediate modern standard Arabic. Builds upon current knowledge levels of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Classes conducted in Arabic.

Upper-Division Courses

ARBC 101A Advanced Arabic 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ARBC 006 or equivalent. An introduction to advanced modern standard Arabic. Builds upon knowledge of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Class conducted in Arabic.

ARBC 101B Advanced Arabic 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ARBC 101A or equivalent. An introduction to advanced modern standard Arabic. Builds upon knowledge of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Class conducted in Arabic.

ARBC 101C Advanced Arabic 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ARBC 101B or equivalent. An introduction to advanced modern standard Arabic. Builds upon knowledge of grammar and vocabulary to gain greater fluency and accuracy in listening, speaking, reading, and writing. Class conducted in Arabic.

ARBC 105 Media Arabic 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ARBC 006 or consent of instructor. Develops listening, speaking, reading, and writing skills through a focus on the language in newspapers, the news, and other forms of media in the Arabic language.

ARBC 110 Advanced Readings in Arabic 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ARBC 006 or consent of instructor. Advanced seminar in the reading of Arabic texts. Focuses on improving students' reading skills while reviewing and deepening knowledge of Arabic grammar and vocabulary. Course is repeatable as content changes up to a maximum of 12 units.

ARLC 120 Classical Arabic Literary Prose 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores aspects of classical Arabic literary prose. Includes the modes of quotation, citation, falsification, fabrication, and forgery. Focuses upon selected writings of al-Hamadhai, al-Jahiz, al-Ma'arri, Ibn Tufayl, and Ibn Hazim.

ARLC 151 Palestine/Algeria 4 Lecture, 3 hours; screening 6 hours per quarter; extra reading, 24 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Considers two distinct and related literary and historical moments: Palestine and Algeria. Topics include the relations between language and context; literature and literary historiography; genre and idiom; violence and the body; and the state and institutional practices of reading. Cross-listed with CPLT 151, and MEIS 151.

ARLC 152 Modern Arabic Poetry in A Multilingual Frame 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers selected writings of Adunis ('Ali Ahmed Sa'id), Mahmoud Darwish, Abdelatif La'abi, and Etel Adnan, published originally in Arabic, French, and English. Topics include language (idiom, statement, utterance, translation, repetition, rhythm) and history (loss, violence, mourning, inheritance, future, legacy). Course is taught in English. Cross-listed with CPLT 152.

ARLC 154 Introduction to Arabic Philosophy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Arabic philosophical texts. Provides close and literary reading of texts in philosophy, as well as considers the impact these texts have had or can have on Western cultural formation. Cross-listed with CPLT 154, and PHIL 128.

ARLC 155 Introduction to Arabic Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to Arabic literature that focuses on language and rhetoric. Considers major issues such as colonialism, secularism, modernity, language, and the state. Utilizes texts from literature, law, and philosophy. Cross-listed with CPLT 155, and MEIS 155.

ARLC 156 Jews and Arabs 4 Lecture, 3 hours; extra reading, 3 hours Prerequisite(s): upper-division standing or consent of instructor. Traces the formation of the shared and divided history of the Jewish and Arab peoples. Focuses on the literary and institutional dimensions of this history, as well as the formation of related areas of study, such as religion, philosophy, literature, and psychoanalysis. Cross-listed with CPLT 156, MEIS 156, and RLST 156.



Cahuilla

Subject Abbreviation: CAH

Lower-Division Courses

CAH 001 Introductory Cahuilla 4 Lecture, 4 hours. Prerequisite(s): none. An introduction to the Cahuilla language. Focuses on the development of listening, speaking, and writing skills. Also explores Cahuilla culture and the sociopolitical aspects of learning and speaking a Native American language.

CAH 002 Introductory Cahuilla 4 Lecture, 4 hours. Prerequisite(s): CAH 001 with a grade of C- or better. An introduction to the Cahuilla language. Focuses on further development of listening, speaking, and writing. Also explores Cahuilla culture and the sociopolitical aspects of learning and speaking a Native American language.

CAH 003 Introductory Cahuilla 4 Lecture, 4 hours. Prerequisite(s): CAH 002 with a grade of C- or better. An introduction to the Cahuilla language. Focuses on further development of listening, speaking, and writing. Also explores Cahuilla culture and the sociopolitical aspects of learning and speaking a Native American language.

Upper-Division Courses

CAH 100 Cahuilla Literature and Linguistics 4 Lecture, 4 hours; individual study, 4 hours. Prerequisite(s): CAH 003 with a grade of C- or better. Builds upon skills developed in first-year Cahuilla to further develop proficiency in listening, speaking, and writing the Cahuilla language. Explores complex grammatical and discourse constructions through guided linguistic analysis of Cahuilla literature (focusing on traditional narrative texts). Also includes practice in developing and narrating original stories.

Chinese

Subject abbreviations: CHN

Committee in Charge

Yenna Wu, Director, Ph.D. *Chinese/Civilizations/ Comparative Literature*

Daryle Williams, Ph.D, Dean, College of Humanities, Arts, and Social Sciences, ex officio

Major

The Chinese Major enables a student to acquire proficiency in the Chinese language and to study Chinese literature, culture, and society using interdisciplinary methods.

1. **Lower-division requirements (12 units plus language proficiency)**
   a) Proficiency in Chinese through the intermediate level (CHN 006 or its equivalent)
   b) Four (4) units from lower-division lecture courses on Chinese literature, culture, and film: AST 030/CHN 030, AST 040/CHN 040, AST 046/CHN 046, AST 048/CHN 048, and any other lower-division lecture courses on Chinese literature, culture, and film chosen in consultation with the student's advisor.
   c) Eight (8) units: CPLT 001 or CPLT 001W, 1 lower-division CPLT course
2. **Upper-division requirements (36 units)**
   a) Twelve (12) units in Chinese language from CHN 101A, CHN 101B, CHN 101C. Students whose proficiency exceeds the 101 series should take the 12 required units by taking CHN 110 (E-Z), CHN 115 (E-Z), by taking the courses listed under (b) or (c), or by using EAP language courses.
   b) Twelve (12) units in Chinese literature, culture, and film from CHN 107, AST 135/CHN 135, AST 136/CHN 136, AST 142/ CHN 142, AST 145/CHN 141/CLA 141/ CPAC 141/POSC 140, AST 148/CHN 148, AST 185/CHN 185/MCS 169, CHN 104, CHN 106, CHN 110 (E-Z), CHN 115 (E-Z), CHN 134, CHN 137, CHN 190, CPLT 142E/ GSST 142E, and any other upper-division lecture courses related to China or East Asia chosen in consultation with the student's advisor.
   c) Eight (8) units in upper-division courses related to China or East Asia from other departments (with adviser's consent), can include the courses listed under (b).
   d) CPLT 193 (4) units. (CPLT 196 strongly recommended but not required)

Chinese Minor

1. **Lower-division requirements (4 units plus language proficiency)**
   a) Proficiency in Chinese through the intermediate level (second year)
   b) Four (4) units from lower-division lecture courses on Chinese literature and culture: CHN 030/AST 030, CHN 040/AST 040, CHN 046/AST 046 or CHN 046W/AST 046W, CHN 048/AST 048
2. **Upper-division requirements (20 units)**
   a) Twelve (12) upper-division units in Chinese language from CHN 101A, CHN 101B, CHN 101C. Students whose proficiency exceeds the 101 series should take the 12 required units by taking CHN 110 (E-Z), CHN 115 (E-Z), by taking the courses listed under (b) or by using EAP language courses.
   b) Eight (8) units in Chinese literature and culture from CHN 104, CHN 106/PHIL 123, CHN 107, CHN 110 (E-Z), CHN 115 (E-Z), CHN 118 (E-Z)/AST 118 (E-Z), CHN 132/AST 132/CLA 132/CPAC 132, CHN 134, CHN 135/AST 135, CHN 136/AST 136, CHN 137, CHN 141/AST 145/CLA 141/CPAC 141/ POSC 140, CHN 142/AST 142, CHN 148/ AST 148, CHN 185/AST 185/MCS 169, CHN 190 CPLT 142E/GSST 142E, and any other upper-division lecture courses related to China or East Asia chosen in consultation with the student's advisor.

Chinese Courses

Foreign Language Placement Examination
A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

Lower-Division Courses

CHN 001 First-Year Chinese 4 Lecture, 4 hours. Prerequisite(s): Student must take the Chinese placement examination. An introduction to the sound system and grammar of Chinese. Focuses on the development of the four skills: understanding, speaking, reading, and writing. Classes are conducted in Chinese as much as possible. Audio-lingual learning materials are available in the language laboratory. Credit is awarded for only one of the following sequences: CHN 001, CHN 002, CHN 003, and CHN 004; CHN 001, CHN 002, and CHN 020B; CHN 020A and CHN 020B.

CHN 002 First-Year Chinese 4 Lecture, 4 hours. Prerequisite(s): CHN 001 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. An introduction to the sound system and grammar of Chinese. Focuses on the development of the four skills: understanding, speaking, reading, and writing. Classes are conducted in Chinese as much as possible. Audio-lingual learning materials are available in the language laboratory. Credit is awarded for only one of the following sequences: CHN 001, CHN 002, CHN 003, and CHN 004; CHN 001, CHN 002, and CHN 020B; CHN 020A and CHN 020B.

CHN 003 First-Year Chinese 4 Lecture, 4 hours. Prerequisite(s): CHN 002 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. An introduction to the sound system and grammar of Chinese. Focuses on the development of the four skills: understanding, speaking, reading, and writing. Classes are conducted in Chinese as much as possible. Audio-lingual learning materials are available in the language laboratory. Credit is awarded for only one of the following sequences: CHN 001, CHN 002, CHN 003, and CHN 004; CHN 001, CHN 002, and CHN 020B; CHN 020A and CHN 020B.

CHN 004 Second-Year Chinese 4 Lecture, 4 hours. Prerequisite(s): CHN 003 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. Provides continuing development of the four skills: understanding, speaking, reading, and writing. Lectures are conducted primarily in Mandarin. Credit is awarded for only one of the following sequences: CHN 001, CHN 002, CHN 003, and CHN 004; CHN 001, CHN 002, and CHN 020B; CHN 020A and CHN 020B.

CHN 005 Second-Year Chinese 4 Lecture, 4 hours. Prerequisite(s): CHN 004 or CHN 020B; or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. Continued development of the four skills: understanding, speaking, reading, and writing. Lectures conducted primarily in Mandarin.

CHN 006 Second-Year Chinese 4 Lecture, 4 hours. Prerequisite(s): CHN 005; or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. Continued development of the four skills: understanding, speaking, reading, and writing. Lectures conducted primarily in Mandarin.

CHN 020A First-Year Chinese For Heritage Learners 4 Lecture, 4 hours. Prerequisite(s): Student must take the Chinese placement examination. A first-year Mandarin Chinese course designed for heritage learners who have some proficiency in listening comprehension and speaking but are unable to read and write in Mandarin. Credit is awarded for only one of the following sequences: CHN 001, CHN 002, CHN 003, and CHN 004; CHN 001, CHN 002, and CHN 020B; CHN 020A and CHN 020B.

CHN 020B First-Year Chinese For Heritage Learners 4 Lecture, 4 hours. Prerequisite(s): CHN 002 with a grade of "C-" or better or CHN 020A with a grade of "C-" or better or equivalent or a sufficiently high test score on the Chinese placement examination as determined by the department faculty. A first-year Mandarin Chinese course designed for heritage learners who have some proficiency in listening comprehension and speaking but are unable to read and write in Mandarin. Credit is awarded for only one of the following sequences: CHN 001, CHN 002, CHN 003, and CHN 004; CHN 001, CHN 002, and CHN 020B; CHN 020A and CHN 020B.

CHN 030 Introduction to Chinese Civilization 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An introduction to Chinese civilization through an interplay of philosophical, historical, religious, and literary readings from the ancient times through the modern age. Uses audiovisual media. All work is in English. Cross-listed with AST 030, and CPLT 030.

CHN 040 Masterworks of Chinese Literature 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): none. Reading and discussion of selected great works of Chinese literature (in English translation) with attention to cultural contexts. Various critical methods and approaches are used. Cross-listed with AST 040, and CPLT 041.

CHN 046 Responses to Political Repression in Modern Chinese Literature and Film 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An examination of the various responses to political repression in China during the second half of the twentieth century through selected literary and artistic representations. Cross-listed with AST 046, and CPLT 042. Credit is awarded for one of the following CHN 046, AST 046, CPLT 042, AST 046W, CHN 046W, or CPLT 042W.

CHN 046W Responses to Political Repression in Modern Chinese Literature and Film 4 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ENGL 001B with a grade of C or better. An examination of the various responses to political repression in China during the second half of the twentieth century through selected literary and artistic representations. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to English 001C. Cross-listed with AST 046W, and CPLT 042W. Credit is awarded for one of the following CHN 046W, AST 046W, CPLT 042W, AST 046, CHN 046, or CPLT 042.

CHN 048 Chinese Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A study of selected films from China and Taiwan focusing on cultural context. Includes what to look for in these films; the interrelations with theater, photography, and literature; and how these films are understood as an art form. Cross-listed with AST 048, CPLT 048, and MCS 048.

CHN 090 Special Studies 1 to 5 Individual Study, 3 to 15 hours. To be taken with the consent of the Chair of the Department as means of meeting special curricular problems in either language or literature. Course is repeatable.

Upper-Division Courses

CHN 101A Third-Year Chinese 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): CHN 006; or equivalent. Further development of the four skills: understanding, speaking, reading, and writing with an emphasis on reading and writing. Classes conducted in Mandarin.

CHN 101B Third-Year Chinese 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): CHN 101A or equivalent or consent of instructor. Further development of the four skills: understanding, speaking, reading, and writing; with an emphasis on reading and writing. Classes conducted in Mandarin.

CHN 101C Third-Year Chinese 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): CHN 101B or equivalent or consent of instructor. Further development of the four skills: understanding, speaking, reading, and writing; with an emphasis on reading and writing. Classes conducted in Mandarin.

CHN 104 Introduction to Classical Chinese Texts 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): CHN 003 or equivalent or consent of instructor. Introduction to classical Chinese philosophical and historical texts. Readings of primary source materials and analysis of grammar and usage. Class is conducted in English.

CHN 106 Readings in Classical Chinese Philosophy 4 Lecture, 3 hours; written work, 2 hours. Prerequisite(s): CHN 104 or consent of instructor. Introduces selections from key philosophical texts in classical Chinese. Focuses on a combination of Chinese reading and philosophical understanding. Cross-listed with PHIL 123.

CHN 107 Taoist Traditions 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): CHN 030 or AST 030 or CPLT 030; restricted to class level standing of junior, or senior; or consent of instructor. A survey of the ancient mystical and philosophical aspects of Taoism as well as the living religious tradition, their relationships to each other, and their expression in Chinese culture and civilization. Topics include the Tao Te Ching, the Chuang-tzu , the Taoist canon, meditation, immortality, alchemy, and ritual.

CHN 110 (E-Z) Readings in 20th Century Chinese Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): CHN 101C with a grade of C- or better; or equivalent. Presents the works of major authors of twentieth-century Chinese literature. Course conducted in Chinese. Credit is awarded for only one of CHN 110E or CHN 137 and for only one of CHN 110M or CHN 134.

CHN 110E Readings in 20th Century Chinese Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): CHN 101C with a grade of C- or better. Explores selections from Chinese fiction from 1950 to the present. Considers questions of language, narrative mode, metaphor, and politics as well as the personal and social backgrounds of authors. Emphasizes the ideas and values of authors and the importance these had for readers. Credit is awarded for one of the following CHN 110E, AST 137, or CHN 137.

CHN 110M Readings in 20th Century Chinese Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): CHN 101C with a grade of C- or better. Explores selections from Chinese fiction from 1918-1949. Considers questions of language, narrative mode, metaphor, and politics as well as the personal and social backgrounds of authors. Emphasizes the ideas and values of authors and the importance these had for readers. Credit is awarded for one of the following CHN 110M, AST 134, or CHN 134.

CHN 110P Readings in 20th Century Chinese Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): CHN 101C with a grade of C- or better. Aims to further develop overall language proficiency beyond the third-year level. Introduces the modern belles-lettres prose in its various styles and themes through representative texts by major authors from the May-Fourth New Culture Movement to the middle of the twentieth century.

CHN 110S Readings in 20th Century Chinese Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): CHN 101C with a grade of C- or better. Aims to further develop overall language proficiency beyond the third-year level. Introduces the modern vernacular poetry through close reading of representative texts by major poets from the New Culture Movement to the middle of the twentieth century. Conducted in modern Chinese.

CHN 110T Readings in 20th Century Chinese Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): CHN 101C with a grade of C- or better. Examines the literary representation of some facets of love in Taiwanese and Chinese fiction from the 1930s to the 1980s. Discusses historical and cultural contexts. Also provides the opportunity to appreciate Chinese literature in the original language and to further improve reading, writing, and discussion skills.

CHN 112 Asian Philosophy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. A survey of Asian contributions to philosophy focusing on the Indian and Chinese traditions. Examines questions concerning how best to live one's life, what can be known, the relation between mind and body, whether there are minds and bodies, and the nature of the universe. Cross-listed with PHIL 110.

CHN 115 (E-Z) Readngs in 13-19 Cen Chn Lit 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): CHN 101C with a grade of C- or better; or equivalent. Covers vernacular literature from the Yuan to the Qing dynasties. Course conducted in Chinese. G. Honglou Meng; M. Ming Novel; Q. Qing Novel; S. The Short Story; Y. Yuan Drama.

CHN 118 (E-Z) Mstrwrks of Chn Lit in Trnsltn 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Examines canonical Chinese works of literature in translation. Conducted in English. E. Anc Times Thru Early Imper Dyn. Cross-listed with AST 118 (E-Z).

CHN 132 Medical Traditions in China and Greece 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): AST 030 or CHN 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or HISE 110 or CLA 102 or CPAC 102 or CLA 112 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CPAC 112 or CLA 113 or HISE 113 or CLA 120E or CLA 120F or CLA 120G or CLA 120J or CLA 121 or CPAC 121 or POSC 121 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CPAC 141 or AST 145 or CHN 141 or CLA 141 or POSC 140 or CPAC 143 or CHN 143 or RLST 143 or CPLT 030; restricted to class level standing of junior, or senior; or consent of instructor. A comparative examination of the early development of Western medical traditions in classical Greece and the origins and development of the Chinese medical systems (now referred to as traditional Chinese medicine). Focuses on their cultural and social contexts. Cross-listed with AST 132, CLA 132, and CPAC 132.

CHN 134 Modern Chinese Literature in Translation 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. An introduction to major works of Chinese fiction, drama, and poetry from the first half of the twentieth century. Considers literary quality and technique, as well as the social and political ideas of Chinese writers during a turbulent time in China's history. Cross-listed with AST 134. Credit is awarded for one of the following CHN 134, AST 134, or CHN 110M.

CHN 135 Great Novels of China 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the social, philosophical, and aesthetic features in major Ming-Qing novels through critical reading and analysis of literature in translation. No knowledge of Chinese required. Cross-listed with AST 135.

CHN 136 Family and Gender in the Chinese Short Story 4 Lecture, 3 hours; extra reading, 3 hours., Prerequisite(s): upper-division standing or consent of instructor. Examines a broad array of short stories from the Tang to the Qing dynasties (approximately ninth to eighteenth century). Investigates love, marriage, family, gender dynamics, and the representation of women in Chinese literature. No knowledge of Chinese required. Cross-listed with AST 136.

CHN 137 Contemporary Chinese Literature in Translation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to important works of fiction, drama, poetry, and reportage from the mid-twentieth century to the present. Includes readings from mainland China, as well as writings from Taiwan and other overseas communities. Cross-listed with AST 137. Credit is awarded for one of the following CHN 137, AST 137, or CHN 110E.

CHN 141 Militarism and Hegemony in the Ancient World 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CHN 030 or AST 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or HISE 110 or CLA 112 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CLA 120E or CPAC 102 or CLA 102 or CPAC 112 or CLA 113 or HISE 113 or CPAC 121 or CLA 121 or POSC 121 or CPAC 132 or AST 132 or CHN 132 or CLA 132 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CLA 143 or CPAC 143 or CHN 143 or RLST 143 or CLA 120F or CLA 120G or CLA 120J or CPLT 030; restricted to class level standing of junior, or senior; or consent of instructor. Comparative study of ancient warfare and hegemony in two or more civilizations of the ancient world. Perspectives may include social and political contexts, gender and war, acquisition of empire, religious wars, and weapons, strategies and tactics in theory and practice. Study of primary source material in texts and visual arts. Cross-listed with AST 145, CLA 141, CPAC 141, and POSC 140.

CHN 142 Zhuangzi 4 Lecture, 3 hours; research, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): CHN 107 or CHN 112 or PHIL 110. An examination of chaos, epistemological and linguistic relativism, fate, skill, and the character of the sage in the

Chinese Daoist text Zhuangzi. Discusses the structure and style of this literary masterpiece. Students with knowledge of classical Chinese may arrange additional work through special studies. Cross-listed with AST 142, and RLST 142.

CHN 143 Divination and Prediction in China and Greece 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): AST 030 or CHN 030 or CPLT 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or CLA 112 or HISE 110 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CLA 120 or CPAC 102 or CLA 102 or CPAC 112 or CLA 113 or HISE 113 or CPAC 121 or CLA 121 or POSC 121 or CPAC 132 or AST 132 or CHN 132 or CLA 132 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CPAC 141 or AST 145 or CHN 141 or CLA 141 or POSC 140; restricted to class level standing of junior, or senior; or consent of instructor. Comparative study of early divination and prediction in early China, ancient Greece, or two other areas of the ancient world. Perspectives include social and intellectual contexts and institutions, as well as gender and boundaries between science, philosophy, and religion. Utilizes primary source material in texts and visual arts. Cross-listed with CLA 143, CPAC 143, and RLST 143.

CHN 148 Chinese Poetry and Poetics in Translation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examination of traditional Chinese poetry through the study of selected major texts. Emphasizes forms, themes, and Chinese poetics in its close relation to the development of Chinese literature. Classes conducted in English. Cross-listed with AST 148.

CHN 185 New Chinese Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020, upper-division standing or consent of instructor. A study of representative films from the People's Republic of China, with a focus on those made during the last decade. Conducted in English; most films have English subtitles. Cross-listed with AST 185, and MCS 169.

CHN 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): upper-division standing or consent of instructor. To be taken with the consent of the Chair of the Department as a means of meeting special curricular problems in either language or literature. Course is repeatable.

CHN 195 Senior Thesis 2 to 4 Thesis, 6 to 12 hours. Prerequisite(s): senior standing; consent of instructor. Individual research and preparation of a thesis completed under the supervision of a faculty member. Course is repeatable to a maximum of 12 units.

European Studies

Committee in Charge

Jeffrey Sacks, Ph.D. *Arabic Literature/ Comparative Literature*

Daryle Williams, Ph.D, Dean, College of Humanities, Arts, and Social Sciences, ex officio

Lower-Division Courses

EUR 042 Italian Americans: Voices and Visions 4 Lecture, 3 hours; screening, 2 hours; written work, 1 hour. Prerequisite(s): none. A study of the Italian American experience as seen through major works of Italian and Italian American writers and filmmakers. Covers the 1950s to the present. No knowledge of Italian required. Cross-listed with ITAL 042.

EUR 043 Italian Cuisine and Literature Through the Centuries 4 Lecture, 3 hours; screening, 2 hours; written work, 1 hour. Prerequisite(s): none. Analyzes the relationship between food and literature in Italian culture through the study of gastronomic and literary texts from the Roman to present times. Cross-listed with ITAL 043

EUR 044 Mafia and Malavita in Italian Literature and Film 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A study of the history of malavita in the Italian peninsula. Explores topics from mischievous transgression to organized crime and Mafia as presented through the works of renowned Italian writers and directors. No knowledge of Italian required. Cross-listed with ITAL 044.

EUR 047 Introduction to Russian Culture 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): none. A multimedia introduction to Russian culture. Emphasis on Russian masterpieces in art, architecture, dance, theatre, literature, film, and music which are characteristic of the culture and life of their period. All work is done in English. Strongly recommended for Russian majors.

EUR 048 Italian Culture and Civilization 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to the concept of Italy and its geographical, historical, and cultural changes from the Middle Ages to the present as seen through the works of renowned writers, artists, and film directors. No knowledge of Italian required. Cross-listed with ITAL 048.

Upper-Division Courses

EUR 111A Survey of Russian Civilization 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers pre-twentieth century Russian music, architecture, and art. Any course within the EUR 111A, EUR 111B, and EUR 111C sequence may be taken independently. No knowledge of Russian is necessary.

EUR 111B Survey of Russian Civilization 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers Russian symbolism and the Great Emigration. Any course within the EUR 111A, EUR 111B, and EUR 111C sequence may be taken independently. No knowledge of Russian is necessary.

EUR 111C Survey of Russian Civilization 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers Soviet culture. Any course within the EUR 111A, EUR 111B, and EUR 111C sequence may be taken independently. No knowledge of Russian is necessary.

EUR 115 (E-Z) French Studies 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Varying topics relating to the literature, thought, and culture of France. Possible topics might include: the Paris mystique, French literary existentialism, individualism in the Renaissance. F: Paris; M: Medieval Women in France. No knowledge of French is necessary.

EUR 115F Paris 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Varying topics relating to the literature, thought, and culture of France. Possible topics might include: the Paris mystique, French literary existentialism, individualism in the Renaissance. F: Paris; M: Medieval Women in France. No knowledge of French is necessary.

EUR 115M Medieval Women in France 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Varying topics relating to the literature, thought, and culture of France. Possible topics might include: the Paris mystique, French literary existentialism, individualism in the Renaissance. F: Paris; M: Medieval Women in France. No knowledge of French is necessary.

EUR 119 (E-Z) Topics in Italian Culture 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. In-depth study of major topics in Italian institutions, society, and culture. E. Contemporary Italy; M. Making Of Italian Arts; R. Risorgimento: Birth Of The Italian Nation; U. Italian Urban Culture. No Knowledge Of Italian Is Required.

EUR 120 Berlin Metropolis in Literature, Film, Music, and Art 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An introduction to the metropolis Berlin as a gateway between the East and West. Explores topography of the city through film, art, music, and literary texts. Considers Berlin's dramatic transformations as a microcosm of Germany and Europe's troubled history in the twentieth century. Course conducted in English. Cross-listed with AHS 120, CPLT 111, GER 111, and MCS 178.

EUR 124 Nordic Mythology, Folklore, and Fairytales 4 Seminar, 3 hours; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the representation of animals, plants, and other appearances of the natural world such as sunrise and sunset in

European creation and destruction mythology, fairytales, and folklore. Cross-listed with GER 124.

EUR 125 German Fairy Tales: From Brothers Grimm to Hollywood 4 Lecture, 3 hours; screening, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores German and European folk and fairy tales from the 18th and 19th centuries, their precursors, and their later variations and receptions in oral, literary, and media cultures of the past and present. Includes their role in American popular culture through adaptations by Disney and Hollywood. Cross-listed with CPLT 125, and GER 125.

EUR 137 Passions, Apparitions, and Automata 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory study of German Romanticism from its origins in Goethe to its development in Hoffmann. Topics include madness, sexual desire, doppelganger, homicide, and automata. All readings are in English; selected readings are in German for German majors and minors. Cross-listed with GER 137, and CPLT 137.

EUR 139 The Divine Comedy 4 Lecture, 3 hours; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or the consent of instructor. A close reading of Dante's "Divine Comedy" using a bilingual edition. Focuses on conceptual and aesthetic questions. Although the work is read in English, students without previous knowledge of Italian are given some instruction in it to enable them to understand parts of the original work. Cross-listed with CPTL 139 and ITAL 139.

EUR 140 Italian Literature of the Holocaust in Translation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores the experiences of Italian Jews during Fascism. Analyzes the attitudes of the Fascist regime, Italian people, and the Catholic Church as seen through the works of renowned Italian writers and directors. Course taught in English. Cross-listed with ITAL 140.

EUR 150 Italian Theatre 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A study of the development of Italian theatre from the commedia dell'arte to the present. Discusses works by Ruzzante, Machiavelli, Metastasio, Goldoni, Alfieri, Verga, Pirandello, Fo, and Rame. Includes videos of plays, melodramas, and operas. No knowledge of Italian required. Cross-listed with ITAL 150.

EUR 158 Italian Literature in the Period of Unification 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): Restricted to class level standing of junior, or senior; A study of nineteenth-century Italian literature. Emphasizes the pre-Unification "Risorgimento" period through the works of Foscolo, Leopardi, Pellico, and Manzoni. No knowledge of Italian required. Cross-listed with ITAL 158

EUR 185 Modern and Contemporary Italian Literature in Translation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; Considers selected works by authors who exemplify major cultural and literary trends in Italy from the period of unification (1860s) to the present. Readings are supplemented by viewing of films. No knowledge of Italian is required. Cross-listed with ITAL 185.

EUR 192 Workshop in European Languages 1 Workshop, 1 hour. Prerequisite(s): concurrent enrollment in an upper-division course in European literature or culture that is taught in English. Taken in conjunction with an upper-division course in European literature or culture, provides discussion and alternative assignments in the language of the student's emphasis. Course is repeatable to a maximum of 6 units.

Classical Studies

College of Humanities, Arts, and Social Sciences

Committee in Charge

Denver Graninger (History)
Kyle Khellaf (Comp Lit & Lang)
Benjamin King, (Comp Lit & Lang)
Jozef Muller (Philosophy)
Michele Salzman (History)
Daryle Williams, Ph.D, Dean, College of Humanities, Arts, and Social Sciences, ex officio
Erin Lam (Comp Lit & Lang)

The objective of the B.A. in Classical Studies is the furthering of knowledge of classical civilization through two emphases: the study of Greek and/or Latin language(s) and literature(s) and the study of courses in English translation on topics including classical literature, history, politics, religion, mythology, and art in order to aid students' appreciation of the Greek and Roman contributions to later Western civilization.

The student who majors in Classical Studies acquires a balanced yet focused view of the language, literature, thought, and civilization of Greece and Rome. The student also obtains the valuable skills of a better vocabulary, a sharper critical sense, logical analysis of texts, coherent argumentation, and a valuable perspective on our own society. Classical Studies majors receive a liberal arts education of traditional excellence and one widely esteemed by business and professional schools. A student may also pursue graduate training in Classics, Art History, History, Philosophy, or other related disciplines.

Major

Language Proficiency

All students in Classical Studies must complete either LATN 001, LATN 002, and LATN 003 (or equivalents) or GRK 001, GRK 002, and GRK 003 (or equivalents). They must also complete 12 upper-division units (or the equivalent) of course work in Latin or Greek.

1. **Language proficiency requirement:**
   a) either LATN 001, LATN 002, and LATN 003 (or equivalents) or GRK 001, GRK 002, and GRK 003 (or equivalents)
   and
   b) Twelve (12) upper-division units or the equivalent of course work in Latin or Greek
2. **Civilization requirement**
   Two courses from CLA 010A, CLA 010B, or CLA 010C, or CLA 010D
3. a) **CPLT 001 or CPLT 001W and 1 lower- division CPLT course (8 units)**
   b) **CPLT 193 (4 units). (CPLT 196 strongly recommended but not required).**
4. **Twenty-four (24) units from the following:**
   a) Upper-division Latin or Greek literature courses beyond the language proficiency requirement
   b) AHS 147, AHS 148, CLA 100/HISE 110 CLA 102/CPAC 102, CLA 112/CPLT 112/RLST 117, CLA 113/CPAC 112/HISE 113, CLA 114/CPLT 114, CLA 120 (E-Z), CLA 121/CPAC 121/POSC 121, CLA 132/AST 132/CHN 132/CPAC 132, CLA 141/CHN 141/CPAC 141, CLA 190, GRK 190, HISE 112, HISE 114/CPAC 133, HISE 115, HISE 116, HISE 117, HISE 118, HIST 103, HIST 110/CPAC 134, LATN 190, PHIL 120(E-Z), PHIL 121Q, POSC 110, RLST 136, THEA 125E
   c) Other courses outside the Classics program related to the major with approval of the student's advisor.

Highly recommended lower-division courses are CLA 040 (Classical Mythology) and CLA 045 (The Ancient World in Film and Television). In their course selection, students should seek exposure to both the Greek and Roman components of the major.

Minor

The Classical Studies minor offers students a fundamental understanding of classical language and culture which form the basis of much of western civilization. The minor naturally complements liberal arts degrees in many areas, including History, Art History, Philosophy, English, and Religious Studies. Students profit from the skills associated with a degree in the classics, such as enhancement of analytical and critical abilities, communication skills, and verbal proficiency.

1. **One course from CLA 010A, CLA 010B, or CLA 010C**
2. **Either LATN 001, LATN 002, and LATN 003 (or equivalents) or GRK 001, GRK 002, and GRK 003 (or equivalents)**
3. **One upper-division course (4 units) in either Latin or Greek**
4. **Three courses from among the following (12 units)**
   a) Greek at or above the 100 level
   b) Latin at or above the 100 level
   c) AHS 147, AHS 148, CLA 100/HISE 110, CLA 102/CPAC 102, CLA 112/CPLT 112/RLST 117, CLA 113/CPAC 112/HISE 113, CLA 114/CPLT 114, CLA 120 (E-Z), CLA 121/CPAC 121/POSC 121, CLA 132/AST 132/CHN 132/

CPAC 132, CLA 141/AST 145/CHN 141/CPAC 141/POSC 140, CLA 190, GRK 190, HISE 111, HISE 112, HISE 114/CPAC 133, HISE 115, HISE 116, HISE 117, HISE 118, HIST 110/CPAC 134, LATN 190, PHIL 120 (E-Z), LATN 190, PHIL 121Q, POSC 110, RLST 136, THEA 125E

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Classics

Subject abbreviation: CLA

Lower-Division Courses

CLA 010A Ancient Civilization: Early Greece and the Mediterranean 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. A broad treatment of history, art and archaeology, and literature, read in translation, comprising a cultural survey of the origins and the first formation of Western civilization.

CLA 010B Ancient Civilization: Classical Greece 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A broad treatment of history, art and archaeology, and literature, read in translation, comprising a cultural survey of the origins and the first formation of Western civilization.

CLA 010C Ancient Civilization: Rome 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A broad treatment of history, art and archaeology, and literature, read in translation, comprising a cultural survey of the origins and the first formation of Western civilization.

CLA 010D Ancient Civilization: Alexander the Great and the Hellenistic World 4 Lecture, 3 hours; discussion, 1 hour. An introduction to Alexander the Great and his legacy in shaping the Hellenistic World. Key themes include Alexander's military conquests in Asia; the kingdoms established by his successors with emphasis on the Ptolemaic and Seleucid dynasties; cultural contact, ethnographic writing, and intercultural societies; and scientific, agricultural, and military technologies.

CLA 017 Rome: the Ancient City 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Traces the development of the city of ancient Rome. Studies the literary and historical evidence alongside the physical remains of the city including its monuments, art, and historical and archaeological remains. Seeks to introduce the Romans and their importance for later ages. Cross-listed with AHS 030, and HIST 027.

CLA 020 Word Power From Greek and Latin Roots 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An intensive study of Greek and Latin elements in English etymology and word derivation. Knowledge of Greek or Latin not required.

CLA 030 Scientific Word Power From Latin and Greek Roots 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A systematic analysis of the scientific terminology in English derived from Greek and Latin stems including those in the biological and natural sciences. Aims to teach word-analysis, increase technical and taxonomic vocabulary, and study our linguistic and cultural debt to Greek and Roman scientific language.

CLA 040 Classical Mythology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introductory survey of the mythology of Greece and Rome. Includes the divine myths, heroic legends, and the implications of these polytheistic systems for ancient culture.

CLA 045 The Ancient World in Film and Television 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A study of representations of Greece and Rome in film, television, and other modern media. Introduces these 'visual texts' both as popular art forms on their own and in relation to their ancient and modern literary sources.

CLA 050 Folktales, Monsters, and Magic in Ancient Greece and Rome 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Examines beliefs of the supernatural as part of life in the ancient world. Topics include magic and witchcraft, the fear of demons and ghosts, and the wish to manipulate invisible powers. Utilizes a variety of media and sources both ancient and modern.

Upper-Division Courses

CLA 100 Ancient Historians 4 Lecture, 3 hours; research, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. The historical development of historiography as evidenced in ancient historical writings from Near Eastern king lists and biblical histories to the narrative histories of Greece and Rome. Focuses on the ideas of history in the various cultures of the ancient Near East and Mediterranean and their relation to modern historical thought. Cross-listed with HISE 110.

CLA 102 Ancient Civilizations and Later Identities 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topical survey of aspects of ancient civilizations appropriated and re-applied to modern cultures. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with CPAC 102.

CLA 112 Mythology 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative study of mythic traditions from several world cultures and religions viewed from a variety of theoretical perspectives. Includes material drawn from epics, religious texts, divine hymns, creation myths, heroic legends, and concepts of the afterlife as reflected in literary and nonliterary sources. Cross-listed with RLST 117, and CPLT 112.

CLA 113 Comparative Ancient Historical Writing 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the literary aspects of historical writing in ancient cultures, with some comparison of the ancient contribution to later authors of the genre. Cross-listed with CPAC112, and HISE113.

CLA 114 The Classical Tradition 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the legacy of Greece and Rome in Western culture, from the Renaissance to the present. Topics include literature, art, architecture, and politics. Cross-listed with CPLT 114.

CLA 120 (E-Z) Themes and Issues of the Classical World 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Focuses on an aspect of antiquity of critical importance to modern culture, and examines the relevant literary texts, artistic monuments, and cultural data. Students explore and interpret ancient sources to gain an appreciation of the differences and similarities between the classical world and the world today. All readings are in English; no knowledge of foreign languages is required. E. Ancient Sexuality And Gender: Myths And Realities; F. Greco-roman Popular Culture; G. Reading Greek And Roman Sports; J. Guide To Living In The Ancient World.

CLA 121 Monarchy 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A cross-cultural survey of the institution of monarchy in the ancient world and its role in political, social, economic, and religious life. Cross-listed with CPAC121, and POSC121. Credit is awarded for only one of CLA 121/CPAC 121/POSC 121 or CLA 121S/CPAC 121S/POSC 121S.

CLA 121S Monarchy 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the cross-cultural survey of the institution of monarchy in the ancient world and its role in political, social, economic, and religious life. Cross-listed with POSC 121S, and CPAC 121S. Credit is awarded for only one of CLA 121/CPAC 121/POSC 121 or CLA 121S/CPAC 121S/POSC 121S.

CLA 132 Medical Traditions in China and Greece 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): AST 030 or CHN 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or HISE 110 or CLA 102 or CPAC 102 or CLA 112 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CPAC 112 or CLA 113 or HISE 113 or CLA 120E or CLA 120F or CLA 120G or CLA 120J or CLA 121 or CPAC 121 or POSC 121 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CPAC 141 or AST 145 or CHN 141 or CLA 141 or POSC 140 or CPAC 143 or CHN 143 or RLST 143 or CPLT 030; restricted to class level standing of junior, or senior; or consent of instructor. A comparative examination of the early development of Western medical

traditions in classical Greece and the origins and development of the Chinese medical systems (now referred to as traditional Chinese medicine). Focuses on their cultural and social contexts. Cross-listed with AST 132, CHN 132, and CPAC 132.

CLA 141 Militarism and Hegemony in the Ancient World 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CHN 030 or AST 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or HISE 110 or CLA 112 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CLA 120E or CPAC 102 or CLA 102 or CPAC 112 or CLA 113 or HISE 113 or CPAC 121 or CLA 121 or POSC 121 or CPAC 132 or AST 132 or CHN 132 or CLA 132 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CLA 143 or CPAC 143 or CHN 143 or RLST 143 or CLA 120F or CLA 120G or CLA 120J or CPLT 030; restricted to class level standing of junior, or senior; or consent of instructor. Comparative study of ancient warfare and hegemony in two or more civilizations of the ancient world. Perspectives may include social and political contexts, gender and war, acquisition of empire, religious wars, and weapons, strategies and tactics in theory and practice. Study of primary source material in texts and visual arts. Cross-listed with AST 145, CHN 141, CPAC 141, and POSC 140.

CLA 143 Divination and Prediction in China and Greece 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): AST 030 or CHN 030 or CPLT 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or CLA 112 or HISE 110 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CLA 120 or CPAC 102 or CLA 102 or CPAC 112 or CLA 113 or HISE 113 or CPAC 121 or CLA 121 or POSC 121 or CPAC 132 or AST 132 or CHN 132 or CLA 132 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CPAC 141 or AST 145 or CHN 141 or CLA 141 or POSC 140; restricted to class level standing of junior, or senior; or consent of instructor. Comparative study of early divination and prediction in early China, ancient Greece, or two other areas of the ancient world. Perspectives include social and intellectual contexts and institutions, as well as gender and boundaries between science, philosophy, and religion. Utilizes primary source material in texts and visual arts. Cross-listed with CHN 143, CPAC 143, and RLST 143.

CLA 190 Special Studies 1 to 5 Prerequisite(s): To be taken with the consent of the chairman of the department as a means of meeting special curricular problems or deficiencies. Course is repeatable.

Graduate Courses

See also UC Tri-Campus Graduate Program in Classics.

CLA 200A Contemporary Literary Theory and the Classics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. An introduction to contemporary literary theory focusing on important critical approaches. Topics vary from year to year. Requires written work that explores theoretical issues and involves engagement with a Greek or Latin text. This work may, for example, illuminate some aspect of a theorist's work, put two theorists into dialogue, or explore the usefulness of a particular approach to texts, authors, or genres. Taught at UC Irvine. Same as UC Irvine CLASSIC 200A. Course is repeatable.

CLA 200B Diachronic Perspectives On Classical Antiquity 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Examines ways in which classical texts and ideas have been received and appropriated for the diverse purposes of ancient and subsequent cultures. Taught at UC Irvine. Same as UC Irvine CLASSIC 200B. Course is repeatable.

CLA 200C Greece and Rome in Their Contemporary Cultural Contexts 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. An introduction to the methods and perspectives of social scientific theory used to study the material and social dimensions of the ancient cultures of Greece and Rome. Taught at UC Irvine. Same as UC Irvine CLASSIC 200C. Course is repeatable.

CLA 201 Research Methods in Classical Studies 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Covers various technical skills essential for successful research and pedagogy in Classics. Includes use of digital resources (e.g., bibliographical databases). Introduces important disciplinary subfields, such as textual criticism and epigraphy. Selection of topics is at the instructor's discretion. Taught at UC Irvine. Same as UC Irvine CLASSICS 201. Course is repeatable.

CLA 250 Seminar in Classics 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Focuses mainly, but not exclusively, on major literary topics. Subject matter varies. Taught at UC Irvine. Same as UC Irvine CLASSIC 220. Course is repeatable.

CLA 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): consent of instructor and graduate advisor; normally open only to students in the UC Tri-Campus Graduate Program in Classics. Supervised independent research. Same as UC Irvine CLASSIC 280. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CLA 292 Concurrent Studies in Classics 2 Individual Study, 6 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Concurrent enrollment in an advanced undergraduate Greek or Latin course, with credit awarded for additional reading and separate examinations. Same as UC Irvine CLASSIC 205. Course is repeatable.

CLA 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Research in preparation for the Candidacy Examination. Same as UC Irvine CLASSIC 290. Graded Satisfactory (S) or No Credit (NC). Course is repeatable,

CLA 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Directed research for the M.A. thesis or Ph.D. dissertation. Same as UC Irvine CLASSIC 299. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Course

CLA 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in Classics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Greek Courses

Subject abbreviation: GRK

Foreign Language Placement Examination A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

Lower-Division Courses

GRK 001 Introduction to Classical Greek 4 Lecture, 4 hours. Prerequisite(s): none. Intensive study of the fundamentals of Attic Greek with practice in reading and writing. Credit is awarded for one of the following GRK 001 or GRK 010.

GRK 002 Introduction to Classical Greek 4 Lecture, 4 hours. Prerequisite(s): GRK 001 with a grade of C- or better. Intensive study of the fundamentals of Attic Greek with practice in reading and writing. Credit is awarded for one of the following GRK 002 or GRK 010.

GRK 003 Introduction to Classical Greek 4 Lecture, 4 hours. Prerequisite(s): GRK 002 with a grade of C- or better. Intensive study of the fundamentals of Attic Greek with practice in reading and writing.

GRK 010 Classical Greek: An Intensive Course 14 Lecture, 14 hours. An intensive introduction to the fundamentals of Classical Greek grammar, aimed at rapidly acquiring a basic proficiency in reading ancient Greek authors. Credit is awarded for one of the following GRK 010, GRK 001, GRK 002, or GRK 003.

Upper-Division Courses

GRK 101 (E-Z) Advanced Greek Reading and Grammar 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): GRK 003 with a grade of C- or better. One or two of the following will be offered every year, according to need. E. Homer <i>iliad; F. Homer (odyssey); G. Lyric Poets; H. Aeschylus; I. Sophocles; J. Euripides; K. Aristophanes; L. Herodotus; M. Thucydides; N. Xenophon; O. The Attic Orators; Q. Aristotle; R. New Testament; T. Hellenistic And Later Greek.

GRK 107 Plato 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): GRK 003 with a grade of "C-" or better or equivalent. An introduction to the language and philosophical thought of Plato. Close reading of selections from one or more Platonic dialogues.

GRK 141 The Pre-Socratics 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): GRK 003 with a grade of C- or better or equivalent. An introduction to the Pre-Socratic philosophers through close reading of selected passages from a variety of authors, in both prose and verse.

GRK 190 Special Studies 1 to 5 Prerequisite(s): To be taken with the consent of the instructor as a means of meeting special curricular problems. Course is repeatable.

Graduate Courses

See also UC Tri-Campus Graduate Program in Classics.

CPLT 290 Directed Studies 1 to 6 Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GRK 292 Concurrent Analytical Studies 2 Research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in GRK 100-series course. To be taken on an individual basis. Each student completes a graduate paper based on research related to the GRK 100-series course. Course is repeatable.

Professional Course

CPLT 301 Teaching of Foreign Language at the College Level 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

Latin Courses

Subject abbreviation: LATN

Foreign Language Placement Examination A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

Lower-Division Courses

LATN 001 Introduction to Latin 4 Lecture, 4 hours. Prerequisite(s): none. Intensive study of the fundamentals of the Latin language with practice in reading and writing.

LATN 002 Introduction to Latin 4 Lecture, 4 hours. Prerequisite(s): LATN 001 with a grade of "C-" or better or equivalent. Intensive study of the fundamentals of the Latin language with practice in reading and writing.

LATN 003 Introduction to Latin 4 Lecture, 4 hours. Prerequisite(s): LATN 002 with a grade of "C-" or better or equivalent. Intensive study of the fundamentals of the Latin language with practice in reading and writing.

Upper-Division Courses

LATN 101 (E-Z) Advanced Latin Reading and Grammar 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): LATN 003. One or two of the following segments are offered every year according to need. E. Plautus; F. Terence; G. Virgil; H. Catullus; I. Horace; J. Ovid; K. Propertius; L. Tibullus; N. Cicero; O. Livy; P. Tacitus; Q. Juvenal; R. Lucretius; S. Seneca; T. Pliny; U. Medieval Latin; Z. Renaissance Latin.

LATN 107 Sallust 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): LATN 003 with a grade of "C-" or better or equivalent. Close reading of selections from Sallust. Primary focus on building a proficiency in reading Latin prose.

LATN 135 The Roman Novel 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): LATN 003. Involves reading and discussion of Latin prose fiction as represented by Petronius' Satyricon and/or Apuleius' Metamorphoses. Emphasizes the development of the romantic novel in Latin.

LATN 190 Special Studies 1 to 5 Individual study, 3 to 15 hours. Prerequisite(s): LATN 003. To be taken as a means of meeting special curricular needs. Course is repeatable.

Graduate Courses

See also UC Tri-Campus Graduate Program in Classics.

CPLT 290 Directed Studies 1 to 6 Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

LATN 292 Concurrent Analytical Studies 2 Research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in LATN 100-series course To be taken on an individual basis. Student will complete a graduate paper based on research related to the LATN 100-series course. Course is repeatable with different topic.

Professional Course

CPLT 301 Teaching of Foreign Language at the College Level 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

The UC Tri-Campus Graduate Program in Classics

https://www.humanities.uci.edu/classics/graduate/index.php

(UC Irvine, UC Riverside, UC San Diego)

The UC Tri-Campus Graduate Program in Classics is a joint venture that combines faculty in Classics and related disciplines from the three southernmost UC campuses.

Students accepted into the program may enroll at any of the three campuses, but they normally apply for admission to the Tri-Campus program through UC Irvine, which is the main location for instruction and administration. Applications to the Tri-Campus program are reviewed by an admissions committee composed of faculty members from all three campuses.

The goal of the program is to provide a graduate education that unites the main currents of modern literary, cultural, and social-scientific theory with the traditional skills and methodologies of classical philology. Candidates for degrees must exhibit facility in Greek and Latin, competence in research, including theoretical approaches to texts and objects, technical mastery of computing for research and teaching, and experience in teaching.

These goals are realized through the four core courses (CLA 200A, CLA 200B, CLA 200C, and CLA 201), seminars (UC Riverside CLA 250/UC Irvine CLASSICS 220) and reading courses (UC Riverside CLA 292/UC Irvine CLASSICS 205).

All students are admitted into the Ph.D. program. With the exception of those granted advanced standing because they hold the M.A. degree in Classics from another institution, entering students are concurrently enrolled in the M.A. program.

Master's Degree

Students are admitted into the Ph.D. program only. Entering students who do not already hold a master's degree in Classics from another institution will be required to complete M.A. requirements while pursuing the Ph.D.

The requirements for the M.A. degree in Classics are two years (six quarters) of course work, passage of a special set of examinations, and completion of a master's paper. The normal course load is three 200-level courses each quarter. Minimum course requirements are four quarters of CLA 200A, CLA 200B, CLA 200C, and CLA 201; four quarters of UC Riverside CLA 292/UC Irvine CLASSICS 205; and four quarters of UC Riverside CLA 250/UC Irvine CLASSICS 220. (UC Riverside CLA 290/UC Irvine CLASSICS 280 may be substituted for these courses at the discretion of the faculty.) Requires a reading knowledge of either Germanic Studies, French, Italian, or equivalent language, demonstrated by examination or other means.

Normative Time to Degree Two years

Doctoral Degree

The requirements for the Ph.D. degree in Classics are three years (nine quarters) of course work. Minimum course requirements are four quarters of CLA 200A, CLA 200B, CLA 200C, and CLA 201; five quarters of UC Riverside CLA 292/UC Irvine CLASSICS 205; and six quarters of UC Riverside CLA 250/UC Irvine CLASSICS 220 or an equivalent course. (UC Riverside CLA 290/UC Irvine CLASSICS 280 may be substituted for these courses at the discretion of the Program faculty.) Students are encouraged to take courses and seminars in relevant areas outside the program at any of the three campuses.

Students must demonstrate reading proficiency in a second modern language by the end of the third year. By the end of the third year and during the fourth year of study, students must have read extensively in the primary texts and in literary history and theory and in ancient history. To qualify as a candidate and enter the dissertation stage, a student must pass an individually designed set of qualifying examinations, including translation examinations in Greek and Latin, written examinations or lengthy papers in special authors and field, and an oral examination.

The facilities, course offerings, programs, and individual faculty mentorship of all three campuses are available to students in the Tri-Campus degree program. The resources of the program are enhanced through a cooperative teaching arrangement among the Tri-Campus program and the Classics graduate programs of UC Los Angeles and the University of Southern California.

Foreign Language Requirement Students must demonstrate reading proficiency in a second modern language by the end of the third year.

Teaching Requirement Experience in supervised teaching and/or research activity is normally required.

Normative Time to Degree Six years

Faculty

Michele Salzman, Ph.D. Director
Professor of History, UCR; Late Antiquity; Roman History and Literature, Religion, Gender and Sexuality Studies

Georgios Anagnostopoulos, Ph.D.
Professor of Philosophy, UCSD; Ancient Greek Philosophy, Ethics, Metaphysics

Cynthia L. Claxton, Ph.D.
Lecturer in Classics, and graduate teaching supervisor, UCI; Greek prose, Historiography

Page duBois, Ph.D.
Professor of Classics and Comparative Literature, UCSD; Greek Literature, Rhetoric, Critical Theory, Cultural Studies

Zina Giannopoulou, Ph.D.
Associate Professor of Classics, UCI; literary theory and Platonic hermeneutics, classical and Hellenistic philosophy, Greek tragedy and epic.

David Glidden, Ph.D.
Professor Emeritus of Philosophy, UCR; Greek and Roman Philosophy

Anna Gonosová, Ph.D.
Associate Professor of Art History, UCI; Byzantine and Medieval Art

Denver Graninger, Ph.D.
Associate Professor of History, UCR; Greek and Roman History, Greek Epigraphy and Archaeology

Monte Johnson, Ph.D.
Associate Professor of Philosophy, UCSD; Classical and Hellenistic Philosophy; Aristotle, Democritus and their later reception in philosophy and science

Dayna Kalleres, Ph.D.
Associate Professor of History and Religious Studies, UCSD; Late Antiquity, Religious Studies, and Critical Theories of Religion

Andromache Karanika, Ph.D.
Associate Professor of Classics, UCI; Greek Epic Poetry, Greek Lyric, Folklore

Benjamin King, Ph.D.
Lecturer in Classics, UCR; Greek Literature and Philosophy

Margaret M. Miles, Ph.D.
Associate Professor of Art History, UCI; Greek and Roman Art and Archaeology, Ancient Sicily, Greek Religion

Kyle Khellaf, Ph.D.
Associate Professor of Classics and Comparative Literature, UCR; ancient historiography, reception studies, postwar French theory, colonial studies, Francophone literature

Erin Lam, Ph.D.
Associate Professor of Comparative Literature and Classics, UCR; reception studies, Latin elegy, Greek tragedy, queer theory, gender and sexuality

Jozef Muller, Ph.D.
Assistant Professor of Philosophy, UCR; Ancient Philosophy, especially Aristotle, Plato, and the Stoics

Maria C. Pantelia, Ph.D.
Associate Professor of Classics, and Director, Thesaurus Linguae Graecae, UCI; Greek Epic Poetry, Hellenistic Poetry, Computer Applications to Classics

Lisa Raphals, Ph.D.
Professor of Chinese/Comparative Literature, UCR

Edward Watts, Ph.D.
Professor of History, UCI (Vassiliadis Endowed Chair in Byzantine Studies); Intellectual and Religious History of the Early Byzantine Empire; Late Antiquity

Andrew Zissos, Ph.D.
Associate Professor of Classics; graduate advisor, UCI; Latin Epic; Medieval Latin; Roman Culture

Graduate Courses

Most of the following courses are taught at the UC Irvine campus.

See also CLA 302 under the Classics section.

CLA 200A Contemporary Literary Theory and the Classics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. An introduction to contemporary literary theory focusing on important critical approaches. Topics vary from year to year. Requires written work that explores theoretical issues and involves engagement with a Greek or Latin text. This work may, for example, illuminate some aspect of a theorist's work, put two theorists into dialogue, or explore the usefulness of a particular approach to texts, authors, or genres. Taught at UC Irvine. Same as UC Irvine CLASSIC 200A. Course is repeatable.

CLA 200B Diachronic Perspectives On Classical Antiquity 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Examines ways in which classical texts and ideas have been received and appropriated for the diverse purposes of ancient and subsequent cultures. Taught at UC Irvine. Same as UC Irvine CLASSIC 200B. Course is repeatable.

CLA 200C Greece and Rome in Their Contemporary Cultural Contexts 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or

consent of instructor. An introduction to the methods and perspectives of social scientific theory used to study the material and social dimensions of the ancient cultures of Greece and Rome. Taught at UC Irvine. Same as UC Irvine CLASSIC 200C. Course is repeatable.

CLA 201 Research Methods in Classical Studies 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Covers various technical skills essential for successful research and pedagogy in Classics. Includes use of digital resources (e.g., bibliographical databases). Introduces important disciplinary subfields, such as textual criticism and epigraphy. Selection of topics is at the instructor's discretion. Taught at UC Irvine. Same as UC Irvine CLASSICS 201. Course is repeatable.

CLA 250 Seminar in Classics 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Focuses mainly, but not exclusively, on major literary topics. Subject matter varies. Taught at UC Irvine. Same as UC Irvine CLASSIC 220. Course is repeatable.

CLA 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): consent of instructor and graduate advisor; normally open only to students in the UC Tri-Campus Graduate Program in Classics. Supervised independent research. Same as UC Irvine CLASSIC 280. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CLA 292 Concurrent Studies in Classics 2 Individual Study, 6 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Concurrent enrollment in an advanced undergraduate Greek or Latin course, with credit awarded for additional reading and separate examinations. Same as UC Irvine CLASSIC 205. Course is repeatable.

CLA 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Research in preparation for the Candidacy Examination. Same as UC Irvine CLASSIC 290. Graded Satisfactory (S) or No Credit (NC). Course is repeatable,

CLA 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): admission to the UC Tri-Campus Graduate Program in Classics or consent of instructor. Directed research for the M.A. thesis or Ph.D. dissertation. Same as UC Irvine CLASSIC 299. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CLA 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in Classics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Comparative Ancient Civilizations

Subject abbreviation: CPAC
College of Humanities, Arts, and Social Sciences

Committee in Charge

Christopher Chase-Dunn (Sociology)
Lucille Chia (History)
Denver Graninger (History)
Kyle Khellaf (Comp Lit & Lang)
Matthew King (Religion)
John Laursen (Political Science)
Jozef Muller (Philosophy)
Michele Salzman (History)
Karl Taube (Anthropology)
Sabine Thuerwaechter (Comp Lit & Lang)
Daryle Williams, Ph.D, Dean, College of Humanities, Arts, and Social Sciences, ex officio

The Comparative Ancient Civilizations B.A. combines the breadth of an interdisciplinary major with the focus of more traditional majors like History or Classical Civilization. By undertaking a comparison of several major cultures of the past that have continued importance in the construction of our present world, the program affords a truly liberal education. Students have a unique opportunity to employ the methods of humanities and social sciences in their major study. They acquire skills of historical and social analysis, multicultural awareness, insight into constructions of gender and sexuality, and mental flexibility.

The major is an excellent choice as a double major taken along with any of the traditional disciplines to add distinction and intellectual breadth to one's background.

Major

1. Lower-division requirements (20 units): CPLT 001 or CPLT 001W, 1 lower-division CPLT course, and any three from ANTH 003, AST 030/CHN 030, CLA 010A, CLA 010B, CLA 010C, CPLT 017A

2. Upper-division requirements (44 units)

a) At least 16 units from CPAC 102/CLA 102, CPAC 112/CLA 113/HISE 113, CPAC 121/CLA 121/POSC 121, CPAC 132/AST 132/CHN 132/CLA 132, CPAC 133/HISE 114, CPAC 134/HIST 110, CPAC 141/AST 141/CHN 141/CLA 141/AST 145/POSC 140

b) CPLT 193 (4 units). (CPLT 196 strongly recommended but not required)

c) The balance (24 units) from any of the following upper-division courses in related disciplines; students are recommended, in consultation with their advisor, to focus on one or two ancient civilizations in related courses to obtain special depth in those areas. Since related course offerings in these areas are often added, some of the most recent courses acceptable to fulfill this requirement may not be listed and students are advised to consult with the major advisor.

Anthropology
ANTH 110
ANTH 117
ANTH 144E

Art History
AHS 144/AST 144
AHS 146/AST 147
AHS 147
AHS 148
AHS 155

Asian Studies
AST 107/CHN 107/RLST 107
AST 136/CHN 136
AST 142/CHN 142/RLST 142
AST 144/AHS 144
AST 147/AHS 147
AST 148/CHN 148

Chinese
CHN 107/AST 107/RLST 107
CHN 142/AST 142/RLST 142
CHN 148/AST 148

Classics
CLA 100/HISE 110
CLA 112/CPLT 112/RLST 117
CLA 113/CPAC 112/HISE 113
CLA 114/CPLT 114
CLA 120 (E-Z)
CLA 121/CPAC 121/POSC 121
CLA 132/CPAC 132/AST 132/CHN 132
CLA 141/CPAC 141/AST 145/CHN 141/POSC 140

Comparative Literature
CLA 112/CPLT 112/RLST 117
CLA 114/CPLT 114

English
ENGL 100 (E-Z)
ENGL 149
ENGL 151A
ENGL 151B

Ethnic Studies
ETST 115 (E-Z)/HISA 144 (E-Z)

Greek
GRK 101 (E-Z)

History
HISA 144 (E-Z)/ETST 115 (E-Z)
HISE 110/CLA 100
HISE 115
HISE 116
HISE 117
HISE 150
HISE 171
HIST 110/CPAC 134
HIST 180
HIST 181

Latin
LATN 101 (E-Z)
LATN 135

Philosophy
PHIL 120 (E-Z)
PHIL 122E

Political Science
POSC 110

Religious Studies
RLST 101
RLST 106
RLST 107/AST 107/CHN 107
RLST 111
RLST 117/CLA 112/CPLT 112
RLST 121
RLST 124 (E-Z)

RLST 128E
RLST 130
RLST 131
RLST 136
RLST 142/AST 142/CHN 142

Upper-Division Courses

CPAC 102 Ancient Civilizations and Later Identities 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topical survey of aspects of ancient civilizations appropriated and re-applied to modern cultures. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with CLA 102.

CPAC 112 Comparative Ancient Historical Writing 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the literary aspects of historical writing in ancient cultures, with some comparison of the ancient contribution to later authors of the genre. Cross-listed with CLA 113, and HISE 113.

CPAC 121 Monarchy 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A cross-cultural survey of the institution of monarchy in the ancient world and its role in political, social, economic, and religious life. Cross-listed with CLA 121, and POSC 121. Credit is awarded for only one of CLA 121/CPAC 121/POSC 121 or CLA 121S/CPAC 121S/POSC 121S.

CPAC 121S Monarchy 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the cross-cultural survey of the institution of monarchy in the ancient world and its role in political, social, economic, and religious life. Cross-listed with POSC 121S, and CLA 121S. Credit is awarded for only one of CLA 121/CPAC 121/POSC 121 or CLA 121S/CPAC 121S/POSC 121S.

CPAC 129A Introduction to Maya Hieroglyphs 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or ANTH 005 or ANTH 007 or ANTH 007S; or consent of instructor. Introduces the Maya hieroglyphs and critically evaluates its political history. Topics include three Maya calendars, a basic grammar (logographs, syllables, verbs, pronouns), three writing methods (transcriptions, transliteration, and translation), dynastic events, gods, supernaturals, and political interactions. Cross-listed with ANTH 129A, and LNST 129A.

CPAC 129B The Linguistics of Ancient Maya Writing 4 Lecture, 3 hours; extra reading, 2 hours; research, 3 hours; term paper, 1 hour. Prerequisite(s): ANTH 129A; or consent of instructor. Analyzes and critically evaluates the linguistics of Ancient Maya Writing. Topics include grammar (transitive, intransitive, positional, active, passive, mediopassive, antipassive, inchoactive verbs, tense, aspect, transitive perfect, noun, pronoun, morphosyllable, phonology); three writing methods (transcriptions, transliteration, and translation); title and rank; scripts and ideologies; and dynastic interactions. Cross-listed with ANTH 129B, and LNST 129B.

CPAC 132 Medical Traditions in China and Greece 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): AST 030 or CHN 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or HISE 110 or CLA 102 or CPAC 102 or CLA 112 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CPAC 112 or CLA 113 or HISE 113 or CLA 120E or CLA 120F or CLA 120G or CLA 120J or CLA 121 or CPAC 121 or POSC 121 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CPAC 141 or AST 145 or CHN 141 or CLA 141 or POSC 140 or CPAC 143 or CHN 143 or RLST 143 or CPLT 030; restricted to class level standing of junior, or senior; or consent of instructor. A comparative examination of the early development of Western medical traditions in classical Greece and the origins and development of the Chinese medical systems (now referred to as traditional Chinese medicine). Focuses on their cultural and social contexts. Cross-listed with AST 132, CHN 132, and CLA 132.

CPAC 133 Ancient Writing and Literacy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Uses cross-cultural comparison to survey writing and literacy in ancient civilizations and how they are related in the origin and development of selected ancient cultures. Cross-listed with HISE 114.

CPAC 134 History of Ancient Astronomy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the origins and history of ancient astronomy from Mesopotamia to the Greco-Roman world. Topics include the problems of the calendar and planetary motion, and the relation between astronomy and astrology in the ancient world. Focuses on readings from primary texts. Cross-listed with HIST 110.

CPAC 141 Militarism and Hegemony in the Ancient World 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CHN 030 or AST 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or HISE 110 or CLA 112 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CLA 120E or CPAC 102 or CLA 102 or CPAC 112 or CLA 113 or HISE 113 or CPAC 121 or CLA 121 or POSC 121 or CPAC 132 or AST 132 or CHN 132 or CLA 132 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CLA 143 or CPAC 143 or CHN 143 or RLST 143 or CLA 120F or CLA 120G or CLA 120J or CPLT 030; restricted to class level standing of junior, or senior; or consent of instructor. Comparative study of ancient warfare and hegemony in two or more civilizations of the ancient world. Perspectives may include social and political contexts, gender and war, acquisition of empire, religious wars, and weapons, strategies and tactics in theory and practice. Study of primary source material in texts and visual arts. Cross-listed with AST 145, CHN 141, CLA 141, and POSC 140.

CPAC 143 Divination and Prediction in China and Greece 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): AST 030 or CHN 030 or CPLT 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or CLA 112 or HISE 110 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CLA 120 or CPAC 102 or CLA 102 or CPAC 112 or CLA 113 or HISE 113 or CPAC 121 or CLA 121 or POSC 121 or CPAC 132 or AST 132 or CHN 132 or CLA 132 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CPAC 141 or AST 145 or CHN 141 or CLA 141 or POSC 140; restricted to class level standing of junior, or senior; or consent of instructor. Comparative study of early divination and prediction in early China, ancient Greece, or two other areas of the ancient world. Perspectives include social and intellectual contexts and institutions, as well as gender and boundaries between science, philosophy, and religion. Utilizes primary source material in texts and visual arts. Cross-listed with CHN 143, CLA 143, and RLST 143.

Comparative Literature

Subject abbreviations: CPLT

Committee in Charge

Jeffrey Sacks, Ph.D., Chair *Comparative Literature/Arabic*
Michelle E. Bloom, Ph.D. *Comparative Literature/French*
Heidi Brevik-Zender, Ph.D. *Comparative Literature/French*
Vrinda Chidambaram, Ph.D. *Linguistics*
Kelly Jeong, Ph.D. *Korean Literature and Culture/Comparative Literature*
Anthonia Kalu, Ph.D. *African Literature and Culture/Comparative Literature*
Kyle Khellaf, Ph.D. *Classics/Comparative Literature*
John N. Kim, Ph.D. *Germanic Studies/Japanese/Comparative Literature*
Mariam Beevi Lam, Ph.D. *Vietnamese/Comparative Literature*
Anne McKnight, Ph.D *Japanese/Comparative Literature*
Trisha Remetir, Ph.D *Comparative Literature/Southeast Asian Studies*
Yenna Wu, Ph.D. *Chinese/Civilizations/Comparative Literature*
Erin Lam, Ph.D. *Comparative Literature/Classics*
Daryle Williams, Ph.D, Dean, College of Humanities, Arts, and Social Sciences, ex officio
Emily Graham, Ph.D *Linguistics*

The department offers the B.A. in Comparative Literature. Comparative Literature is an interdisciplinary field which is studied internationally. At UCR, the Comparative Literature curriculum is organized around a core staff of comparatists assisted by qualified faculty from other departments and programs. The discipline of Comparative Literature encourages

study of interliterary relationships among various cultural traditions; on the graduate level, it seeks to promote the study of interdisciplinary relationships. Comparative Literature courses, undergraduate or graduate, require that the majors read whenever possible in the languages (two for undergraduates, one of which may be English, and three for graduates) they present. Non majors may do all the readings in English translations. Comparative Literature majors may also work with translations.

Comparative Literature and World Literature courses are open to all students.

Major

1. **Lower-division requirements (12 units plus proficiency)**
   a) Proficiency in at least one language (besides English), ancient or modern, through the intermediate level (second year)
   b) CPLT 001 or CPLT 001W, and 1 lower-division CPLT course
   c) CPLT 017C or 1 lower-division ARLC, CHN, CLA, CPAC, CPLT, EUR, FREN, GER, ITAL, JPN, KOR, RUSN, SEAS, or VNM course on literature, culture, cinema, or the like.
2. **Upper-division requirements (36 units)**
   a) Twelve (12) units in one literature, distributed as much as possible among courses representing the various literary periods
   b) Eight (8) units in a second literature
   c) CPLT 110, CPLT 193, (CPLT 196 strongly recommended but not required)
   d) Eight (8) elective units in Comparative Literature

Students contemplating graduate study in Comparative Literature are urged to complete two years in a second (non-English) language before graduation.

Graduate Programs

The Department of Comparative Literature and Languages grants graduate degrees based on the comparative studies of world literatures and cultures. The Ph.D. degree has three tracks: Interliterary Studies, Interdisciplinary Studies, and Science Fiction, Science, and Literature described below. The department faculty, well balanced between Asianists and Europeanists, share a strong commitment to the study of literature through comparative and interdisciplinary approaches. We have particular strengths in comparative Asian and European studies; comparative ancient studies; gender and feminist studies; global cultures and post-colonialism; film and visual culture studies; narrative and cultural translation; and science and science fiction.

Students are admitted into the Ph.D. program only. Entering students who do not already hold a master's degree in Comparative Literature, in literature, or in comparable fields from another institution must complete M.A. requirements while pursuing the Ph.D.

Admission
Admission is open to qualified candidates with a B.A. or M.A. degree, preferably in Comparative Literature or a related field. All other admission requirements are specified in the graduate application.

S/NC Courses
No S/NC-graded courses may be applied toward the minimum unit requirement for the graduate degree(s).

Note: Courses in the student's special literature areas used to fulfill either the M.A. or Ph.D. literature requirements may be either graduate courses, or undergraduate courses together with a concurrent 292 course.

Language Requirement
Students must have attained at least advanced language competency in their non-English areas of literary specialization. Competency is demonstrated by one of the following for each language required for a student's particular literary specializations:

1. Course Work A translation seminar with additional work in a specific national language/literature as required by the instructor.
2. Translation Examination A translation exercise from the foreign language into English with use of only a dictionary administered on campus and about two hours long. Period and genre should be discussed in advance with the examiner. The choice of examiner is approved by the graduate advisor.

Master's Degree

The Department of Comparative Literature and Languages requires the following for the M.A. degree in Comparative Literature.

All students must complete a minimum of 36 units of course work. Candidates must work in three of the following literatures, or two literatures for students in the interdisciplinary track: Chinese, English (either British or American), French, German, Classical Greek, Italian, Indonesian, Japanese, Latin, Philippino, Portuguese, Russian, Spanish, and Vietnamese.

Requirements are as follows:

1. Two courses in canonical literature (CPLT 210)
2. Two courses in methods and theory (CPLT 214 and CPLT 215A)
3. One course from CPLT 212, CPLT 222, or CPLT 301
4. Two graduate courses in each of three literatures or in each of two literatures and one interdisciplinary area
5. Three elective courses in Comparative Literature

Note: Students must take at least one graduate course in each of the following four areas: European, Asian, Ancient, and Modern Literature.

After completing the course requirements, the student has two options:

a) Submit a portfolio of three essays, each one representing one of their three literary or interdisciplinary areas, and write a 750-1000 word commentary explaining the aims and achievements of the essays in relation to one another.
b) Write a comprehensive research paper (40-50 pages) that incorporates their three interliterary or interdisciplinary areas; this paper may develop topics of previous papers, or explore a new topic area.

The student then undergoes oral examination on the portfolio or the research paper. Following the examination, the graduate committee, after evaluation of the student's entire graduate record, determines the candidate's suitability for continuing in the Ph.D. program.

Doctoral Degree

The Department of Comparative Literature and Languages offers the Ph.D. degree in Comparative Literature with three tracks: Interliterary Studies, Interdisciplinary Studies, and Science Fiction, Science, and Literature. Areas of particular strength in the Interdisciplinary Studies are comparative Asian and European studies; comparative ancient civilizations; gender and feminist studies; global cultures and post-colonialism; film and visual culture studies; narrative and cultural translation; and science and science fiction.

Interliterary Studies
This program is designed for students wishing to concentrate in Comparative Literature as an interliterary discipline. Students examine the relation among various national literatures. They are expected to work in three of the following literatures: Chinese, English (either British or American), French, German, Classical Greek, Italian, Indonesian, Japanese, Latin, Portuguese, Russian, Spanish, and Vietnamese. Permission is granted in exceptional cases to work in other literatures related to the Germanic, Romance, or Slavic families, in Hebrew or Arabic literature, in other Asian Literatures, and the literatures of Africa.

Students must obtain comprehensive knowledge of their first literature (the major specialty), in its language, literary history, and critical scholarship. In their two other literatures, they specialize in a genre, a period, critical school or theoretical approach, always in combination with their main literature. Work in the three literatures must be done in the languages of these literatures.

Students entering the interliterary Ph.D. program with an M.A. in literature must take two courses from the canons (CPLT 210), CPLT 214, and CPLT 215A (or demonstrate having taken similar courses).. Course requirements are two graduate courses in a first literature, two graduate courses in a second literature, two graduate courses in a third literature, and three additional elective graduate courses in Comparative Literature.

Note: Students must take at least one graduate course in each of the following four areas: European, Asian, Ancient, and Modern Literature.

Students entering the interliterary Ph.D. program with an M.A. in another discipline must do course work equivalent to the M.A. degree in Comparative Literature while proceeding with course work for the Ph.D. program.

Interdisciplinary Studies
This program is designed for students with interests in interdisciplinary studies. Students examine relationships between literary studies and other disciplines (such as art, ethnic studies, film, history, law, music, philosophy, political science, psychology, religious studies, science, sociology, theater). Students complete the literary requirements of the program but substitute an appropriate discipline for one of the second or third literatures. This option is recommended to students who enter Comparative Literature with an M.A. in a non-literary discipline.

Students entering the interdisciplinary studies Ph.D. program with an M.A. in any discipline must take two courses from the canons (CPLT 210), as well as CPLT 214 and CPLT 215A (or demonstrate having taken similar courses). In addition, course requirements are two graduate courses in each of two literatures; two courses in another discipline; and three elective graduate courses in Comparative Literature. The graduate advisor may require appropriate courses on an individual basis.

Note: Students must take at least one graduate course in each of the following four areas: European, Asian, Ancient, and Modern Literature.

Science Fiction, Science, and Literature
This option is designed for students with interests in science fiction studies and the relations of science to world literature. It builds upon the current widespread interest in Science Fiction and draws on the Eaton Collection. The program is intended for students who have already completed an undergraduate degree in Comparative Literature, English or kindred studies. It draws on the speculative richness of science fiction literature in a wide variety of social contexts, including the role of science in society (genetic engineering, artificial environments, nanotechnology, etc.), race and ethnicity, and social ethics. This track interacts with existing programs in the humanities, arts, social sciences and sciences. It is inherently cross-disciplinary both within the humanities, and between the humanities and sciences.

Students entering the Science Fiction, Science, and Literature Ph.D. program with an M.A. in any discipline must take courses from the following areas:

1. Three theory courses from among CPLT 214, CPLT 215A, and CPLT 210 (repeatable).
2. Three science, science fiction theory, literature and methods courses, including CPLT 272, CPLT 273, CPLT 274, CPLT 275.
3. One history of science course, (PHIL 237, PHIL 239, CHN/CLA 231, CHN/CLA 232, CPAC 134)
4. One course in Film and Media Studies (SOC 211, CPLT 174, CPLT 173, MCS 175, MCS 139, MCS 146)
5. One course in Philosophy or Religion from among either PHIL 234, PHIL 237, PHIL 238 and PHIL 239 or RLST 200A, RLST 200C, and RLST 224)
6. One course in Social Sciences (ANTH 261, ANTH 277, ANTH 279, CHN/CLA 141, SOC 247, SOC 261, SOC 281)
7. Three elective courses from any of the groups listed above.

Among all the various courses selected there must be at least one course on non-Western materials and two graduate literature courses with readings in the original language in each of the student's two language areas. Language areas include: Arabic, Chinese, English, French, German, Classical Greek, Italian, Indonesian, Japanese, Latin, Philippino, Portuguese, Russian, Spanish, and Vietnamese. The graduate advisor may require appropriate courses on an individual basis. When taking any upper-division undergraduate course listed here, the student must enroll in a 292 course.

Teaching Requirement Normally some teaching experience is required; such experience is obtained through a teaching assistantship whereby a student is assigned either to Comparative Literature or to another program. Students are strongly recommended to take one of the pedagogy courses in the department (CPLT 222 or CPLT 301) which may be used as one of their required elective courses.

Written and Oral Qualifying Examinations
The written qualifying examination consists of the following:

1. For a student in the track of Interliterary Studies, the examination consists of four parts, which include the three national literatures that the student specializes in, with a comparative perspective, and on critical theory.
2. For a student in the track of Interdisciplinary Studies, the examination consists of four parts, which include two national literatures and one non-literary discipline that the student specializes in, with a comparative perspective, and on critical theory.

Prior to the examination for either track, students in consultation with the designated members of their committee, formulate a Special Reading List based on available departmental reading lists for each of the four parts that reflects the student's chosen fields of study and research and provides a basis for the examination.

Each of the four parts of the written examination for either the Interliterary or the Interdisciplinary Track is a three-hour exam.

The written examinations are followed by an oral qualifying examination.

Dissertation and Final Oral Examination
Candidates must write a dissertation on a topic approved by the dissertation committee and may be required to successfully undergo an oral examination on the dissertation.

Normative Time to Degree 18 quarters

Lower-Division Courses

CPLT 001 Introduction to Close Reading 4 Lecture, 3 hours; discussion, 1 hour. Teaches focused reading of works of literature and construction of compelling written arguments about texts. Explores methods of analyzing literature, framing relevant questions, and writing clear essays. Compares fiction and nonfiction, poetry and prose, narrator and author, and ancient and modern. Also covers basic critical concepts. Emphasizes non-English language traditions. Credit is awarded for one of the following CPLT 001 or CPLT 001W.

CPLT 001W Introduction to Close Reading 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 040U; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Teaches focused reading of literature and construction of compelling written arguments. Compares fiction and non-fiction, poetry and prose, and narrator and author. Also covers basic critical concepts. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits as alternatives to WRIT 030. Credit is awarded for one of the following CPLT 001W or CPLT 001.

CPLT 002 Reading World Literature 4 Lecture, 3 hours; discussion, 1 hour. Teaches concepts of cross-cultural literacy. Explores how writers in different cultures use literature to define the human, process the foreign, and perceive the world. Discusses what world literature has been and what it could be. Considers reading as a tool for approaching cultural difference. Emphasizes non-English language traditions.

CPLT 012 The Writer in Writing 4 Lecture, 3 hours; written work, 2 hours; research, 1 hour. Prerequisite(s): none Targeted at the fledgling creative writer and apprentice literary critic, surveys the complex legacy surrounding the figure of the writer in world literature. Discussion and weekly writing exercises demonstrate the use of brainstorming in creating and critiquing literature. Cross-listed with CRWT 012.

CPLT 017A Masterworks of World Literature 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Explores selected great works of literature from around the world in historical and cultural contexts. Covers antiquity to the early Renaissance, emphasizing textual analysis.

CPLT 017B Masterworks of World Literature 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Explores selected great works of literature from around the world in historical and cultural contexts. Covers the early Renaissance to the Enlightenment, emphasizing textual analysis.

CPLT 017C Masterworks of World Literature 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Explores selected great works of literature from around the world in historical and cultural contexts. Covers the modern period, emphasizing critical methods and approaches to comparative literature.

CPLT 021 Introduction to Film, Literature, and Culture 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Surveys critical approaches to the cinema such as auteur and genre theory. Studies literature and film, national cinemas, and film movements.

CPLT 022A Introduction to World Literature By Women 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to world literature by women across many centuries. Covers the creative

work of women from ancient to early modern periods, examining both texts and the historical circumstances of the earliest women writers. Emphasizes texts originally written in languages other than English from around the globe. Cross-listed with GSST 022A.

CPLT 022B Introduction to World Literature By Women 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to the increasingly powerful voices of women writers in modernity and postmodernity. Emphasizes texts originally written in languages other than English from around the globe. Topics include the question of feminine writing and feminist theories about literature by women. Cross-listed with GSST 022B.

CPLT 023 Modern Japan and Personal Narrative 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1.5 hours. Introduces major debates in history, politics, and culture through the genres of biography, autobiography, diary, and confession. Explores the parallel construction of the modern nation, the modern language, and the modern self. Traces the development of Japan's "I-novel." Builds skills in close reading by studying the rhetoric of self-narrative. Cross-listed with AST 023, and JPN 023.

CPLT 024 World Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Introduction to world cinema as a fusion of national and international, culturally specific, and globally universal characteristics. Topics include realism, the role of world wars, Hollywood's global reach, alternative aesthetics of third-world cinemas, cross-fertilization between Europe and Asia, and the function of international film festivals and the international film market. Cross-listed with MCS 024.

CPLT 025 Introduction to Science Fiction 4 Lecture, 3 hours; research, 3 hours. Considers science fiction as an interface between today's scientific and humanistic disciplines. Utilizes books, films, and works of art to examine the interplay of these disciplines. Explores the perspective of science fiction on such themes as time, space, God, nature, mind, and the future.

CPLT 026 Introduction to Literature, Film, and Art By French and Francophone Women 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Analyzes literature, art, and film by French and Francophone women from the 1400s to the present. Topics including marriage, motherhood, war, postcolonial conditions, space, sexual identity, fashion, feminism, and modernity. Studies transnational points of view of French-speaking women from and in Europe, Africa, and Asia. Course taught entirely in English. Cross-listed with FREN 026.

CPLT 027 Food in Film 4 Lecture, 3 hours; discussion, 1 hour; screening, 3 hours. Explores the representation of food, cooking, and restaurants in films from different national traditions. Includes gender roles; sensuality and sexuality; social class and the economics of food; and excess and lack. Cross-listed with MCS 036.

CPLT 028 Justice, Law, Violence 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the concepts of justice, law, and violence through literary and philosophical texts. Raises fundamental questions of individual human existence within the social collective. Topics include natural right, freedom of will, sacrifice, revolution, gender, and power.

CPLT 029 The Arts: Approach, Comparison, and Culture 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introductory course on the arts, their meaning and interrelationship as well as their cultural contexts East and West. Stresses such approaches as: How do you understand a poem? What do you look for in a painting? What do you listen for in music? How do different cultural backgrounds help in appreciating a work of art?

CPLT 030 Introduction to Chinese Civilization 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An introduction to Chinese civilization through an interplay of philosophical, historical, religious, and literary readings from the ancient times through the modern age. Uses audiovisual media. All work is in English. Cross-listed with AST 030, and CHN 030.

CPLT 037 Otaku Worldwide: the Globalization of Japanese Media and its Subcultures 4 Lecture, 3 hours; written work, 2 hours; extra reading, 1 hour. Prerequisite(s): none. Explores the historical contingency of subcultures, key moments in the evolving discourse on 'otaku' both within and outside Japan, and considers how the term is used to identify consumers and fan cultures. Explores how manga and anime reflect class, gendered, and erotic resistance to dominant political structures. Cross-listed with JPN 037.

CPLT 040 Literary Response to Disaster and Repression 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An examination of how literature (e.g., memoir, fiction, and poetry) can be utilized in the recovery from disaster or repression. Analyzes examples from Asia, Africa, and Europe to address the issues of looking squarely, coming to terms, commemoration, and apology. Cross-listed with HIST 040. Credit is awarded for one of the following HIST 040, CPLT 040, or CPLT 040W.

CPLT 040W Literary Response to Disaster and Repression 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ENGL 001B with a grade of C or better. Examines how literature is utilized in the recovery from major disaster or repression. Analyzes examples from Asia, Africa, and Europe that address the issues of looking squarely, coming to terms, commemoration, and apology. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to English 001C. Credit is awarded for one of the following CPLT 040W, CPLT 040, or HIST 040.

CPLT 041 Masterworks of Chinese Literature 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): none. Reading and discussion of selected great works of Chinese literature (in English translation) with attention to cultural contexts. Various critical methods and approaches are used. Cross-listed with AST 040, and CHN 040.

CPLT 042 Responses to Political Repression in Modern Chinese Literature and Film 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An examination of the various responses to political repression in China during the second half of the twentieth century through selected literary and artistic representations. Cross-listed with AST 046, and CHN 046. Credit is awarded for one of the following CHN 046, AST 046, CPLT 042, AST 046W, CHN 046W, or CPLT 042W.

CPLT 042W Responses to Political Repression in Modern Chinese Literature and Film 4 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ENGL 001B with a grade of C or better. An examination of the various responses to political repression in China during the second half of the twentieth century through selected literary and artistic representations. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to English 001C. Cross-listed with AST 046W, and CHN 046W. Credit is awarded for one of the following CHN 046W, AST 046W, CPLT 042W, AST 046, CHN 046, or CPLT 042.

CPLT 046 Representing the Holocaust in Words and Images 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Introduces representations of the Holocaust in documentary and narrative film, literature, and painting. Explores notions such as memory, mourning, trauma, spectatorship, and atrocity to come to terms with different responses to the Holocaust. Topics include memorialization, stigmatization, the ethics of historical representation, and black humor. Cross-listed with GER 046.

CPLT 048 Chinese Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A study of selected films from China and Taiwan focusing on cultural context. Includes what to look for in these films; the interrelations with theater, photography, and literature; and how these films are understood as an art form. Cross-listed with AST 048, CHN 048, and MCS 048.

CPLT 056 Cultures of the Japanese Empire 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers the social histories and literatures of the Japanese Empire from the foundation of the Meiji state to the present. Includes the Ainu, Okinawan, Taiwanese, and Korean cultures. Explores the concepts of assimilation, citizenship, national language, nation-state, sovereignty, total war, and translation. Utilizes readings in English. Cross-listed with JPN 056, and AST 056.

CPLT 062 Introduction to Southeast Asian Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introduction to modern and contemporary Southeast Asian literature and culture with a focus on individual national histories. Explores the relationship between aesthetics, politics, and academic scholarship. Readings are in translation; classes conducted in English. Cross-listed with AST 062, and SEAS 062.

CPLT 063 Reading Southeast Asian Stories 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introduction to the modern short story in Southeast Asia focusing on literariness and the act of reading. Readings are in translation; classes conducted in English. Course is repeatable as content or topic changes to a maximum of 8 units. Cross-listed with AST 063, and SEAS 063.

CPLT 070 Introduction to African Literature 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. An introduction to African literature in English. Traces the history of African literary traditions from its oral beginnings to the early 2000s. Themes include colonialism across the continent, apartheid in South Africa, politics of post-independence, gender, African aesthetics, and diverse cultures on the continent.

CPLT 072 African Oral Literature & Cultures 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces traditional African storytelling and oral narrative performance. Examines selected oral narratives from ancient African civilizations through the continent's contemporary encounters with European colonization. Includes primary readings of English translations from relevant indigenous African languages. Explores the African storyteller's craft and uses of the oral narrative.

Upper-Division Courses

CPLT 110 Literary Analysis and Criticism 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of different critical approaches to literature, through reading and discussion of literary texts and critical essays on those texts. Reading and discussions cover different genres and traditions as well as different critical approaches.

CPLT 111 Berlin Metropolis in Literature, Film, Music, and Art 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An introduction to the metropolis Berlin as a gateway between the East and West. Explores topography of the city through film, art, music, and literary texts. Considers Berlin's dramatic transformations as a microcosm of Germany and Europe's troubled history in the twentieth century. Course conducted in English. Cross-listed with AHS 120, EUR 120, GER 111, and MCS 178.

CPLT 112 Mythology 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative study of mythic traditions from several world cultures and religions viewed from a variety of theoretical perspectives. Includes material drawn from epics, religious texts, divine hymns, creation myths, heroic legends, and concepts of the afterlife as reflected in literary and nonliterary sources. Cross-listed with CLA 112, and RLST 117.

CPLT 114 The Classical Tradition 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the legacy of Greece and Rome in Western culture, from the Renaissance to the present. Topics include literature, art, architecture, and politics. Cross-listed with CLA 114.

CPLT 115 Modern German History Through Film 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores twentieth-century German history through film. Includes World Wars I and II, inflation and polarization of classes, Nazi Germany, representations of the Holocaust, and a divided and reunited Germany. Cross-listed with GER 163, MCS 115, and HISE 163.

CPLT 116 Japan and its Others 4 Lecture, 3 hours; extra reading, 1 hour; outside research, 1 hour; written work, 1. Prerequisite(s): upper-division standing or consent of the instructor. Studies gender/race/ethnic/sexual politics and minority cultural productions in modern Japan. Explores the historical backgrounds/epistemology of minority politics in Japan. Introduces the vibrant yet underprivileged voices of minority subjects. Includes LGBTQ issues, Zainichi Koreans, Ainu, Okinawa, Abelism, and the Buraku caste system. Cross-listed with JPN 116.

CPLT 118 The Alien as Other 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers the alien in science fiction studies as an image of both alterity (Otherness) and a reflection on what it means to be human. Topics include alien contact, societies and languages, and the deliberate modifications of both humans and aliens. Utilizes short stories, novels, and film.

CPLT 120 Autobiography 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the genre of literary autobiography and its visual equivalents (self-portraits and autobiographical film). An examination of narrative structure and point of view; the boundaries between fiction and nonfiction; and concepts such as masks, sexuality, memory, and biculturalism. Focus may change from year to year. Course is repeatable as topics change.

CPLT 121 Crossing Borders: Immigration, Migration, and Exile in Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Proposes an international look at the phenomenon of migration through film. Film can be considered the foremost medium to do justice to this issue.

CPLT 123 Transnational Feminist Film and Media 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers contemporary women's and feminist film and media productions. Connects the forces of globalization and militarization with gender-related experiences of displacement, migration, immigration, diaspora, trafficking, and refugee status. Focuses on innovative uses of visual language signaling changes in notions of nation, identity, class, race, ethnicity, gender, and sexuality. Cross-listed with GSST 123.

CPLT 125 German Fairy Tales: From Brothers Grimm to Hollywood 4 Lecture, 3 hours; screening, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores German and European folk and fairy tales from the 18th and 19th centuries, their precursors, and their later variations and receptions in oral, literary, and media cultures of the past and present. Includes their role in American popular culture through adaptations by Disney and Hollywood. Cross-listed with EUR 125, and GER 125.

CPLT 126 From Novel to Screen: Film Adaptations of German Literature 4 Lecture, 3 hours; screening, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to classic works of German literature and their film adaptations. Explores adaptations by film directors such as Welles, Kubrick, Visconti, and Fassbinder. Studies the nexus between literature, film, and theatre. Course conducted in English. Cross-listed with MCS 126, and GER 126.

CPLT 131 Marx, Nietzsche, Freud 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Critical introduction to three central thinkers of modernity. Topics include alienation, free will, revolution, the unconscious, sexual difference, political power, and the modern conception of truth. Readings and discussions are in English. Selected readings are in German for German majors and minors. Cross-listed with GER 131.

CPLT 132 Rousseau and Revolution 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory study of the French philosopher and novelist Jean-Jacques Rousseau and the age of revolution in France, Germany, and England. Topics include social inequality, slavery, gender, subjectivity, violence, and political rights. All readings are in English. Cross-listed with FREN 132, and GER 132.

CPLT 134 Cinematic War Memory 4 Lecture, 3 hours; screening, 2 hours; extra reading, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines cinematic confrontations involving World War II in Germany and Japan. Topics include desire between victims and perpetrators,

representation of trauma, and ethical responsibility. All screenings have English subtitles. Cross-listed with MCS 114, GER 134, and JPN 134.

CPLT 136 The Enlightenment and its Consequences: Modern Europe in the Arts 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the basic ideas of modernity in Europe that are central to the history of western cultures and civilization. Focuses on the function of the arts and sciences in relation to the philosophy and concepts of the Enlightenment. Addresses humankind's changing relationship to religion, state, society, and history, as well as new strategies of self-reflection. Cross-listed with GER 136.

CPLT 137 Passions, Apparitions, and Automata 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory study of German Romanticism from its origins in Goethe to its development in Hoffmann. Topics include madness, sexual desire, doppelganger, homicide, and automata. All readings are in English; selected readings are in German for German majors and minors. Cross-listed with GER 137, and EUR 137.

CPLT 139 The Divine Comedy 4 Lecture, 3 hours; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or the consent of instructor. A close reading of Dante's "Divine Comedy" using a bilingual edition. Focuses on conceptual and aesthetic questions. Although the work is read in English, students without previous knowledge of Italian are given some instruction in it to enable them to understand parts of the original work. Cross-listed with EUR 139 and ITAL 139.

CPLT 142 (E-Z) Women's Writing in Modern Asia and Asian America 4 Seminar, 3 hours; extra reading, 3 hours. Covers comparative histories of feminist literary movements, gender and immigration, autobiography, translation, and subjectivity. Asian literature will be circulated in the original language to students with reading ability (not required). E. Chinese And Chinese American Writing; J. Japanese And Japanese American Writing; K. Korean And Korean American Writing; U. Vietnamese And Vietnamese American Writing. Cross-listed with GSST 142 (E-Z).

CPLT 143 France and Asia in Literature and the Arts 4 Lecture, 3 hours; screening, 20 hours per quarter; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores French portrayals of Asia in literature, cinema, the other arts, and popular culture. Topics include colonialism, orientalism, gender, race, and language. Cross-listed with FREN 143.

CPLT 145 Modern Japanese Thought 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of modern Japanese thought from a theoretical and intellectual historical perspective. Topics include philosophical discussions of modernization, "Westernization," nationalism, colonialism and imperialism, "comfort women," Japanese war crimes in continental Asia, the American bombing of Hiroshima and Nagasaki, post-World War II remembrance and denial. All readings are in English. Cross-listed with JPN145.

CPLT 146 Comedy and Satire 4 Lecture, 3 hours; outside reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates the origins and historical development of contemporary Western culture's two most popular genres. Although the focus is on literary texts ranging from Aristophanes to the present, the course also considers the many other cultural media through which the comic and the satiric find expression--among them, caricature drawing, photography, comic books, film, and television. Attention is given to debates about the related functions of irony, laughter, violence, and sexuality.

CPLT 147 (E-Z) The Novel 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Investigation of the novel as a preeminent register of cultural values and common literary themes derived from the various national literatures and literary epochs. Examines the novel form in terms of selected, related works by some of its greatest practitioners. E. The Existential Novel; F. The Carnivalesque.

CPLT 148 Short Narrative 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis and interpretation of short narrative texts from the linked perspectives of universal themes and shared literary concerns. The finest short prose, including the anecdote, short story, tale, and novella, by some of the world's greatest writers is explored in depth.

CPLT 149 The Development of Classical Modern Drama 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Consisting of readings, discussions, and lectures, treats plays and theories from the German, Scandinavian, Russian, and French repertoire among others. Covers Naturalism to Expressionism (1880-1918).

CPLT 151 Palestine/Algeria 4 Lecture, 3 hours; screening 6 hours per quarter; extra reading, 24 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Considers two distinct and related literary and historical moments: Palestine and Algeria. Topics include the relations between language and context; literature and literary historiography; genre and idiom; violence and the body; and the state and institutional practices of reading. Cross-listed with ARLC 151, and MEIS 151.

CPLT 152 Modern Arabic Poetry in A Multilingual Frame 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers selected writings of Adunis ('Ali Ahmed Sa'id), Mahmoud Darwish, Abdelatif La'abi, and Etel Adnan, published originally in Arabic, French, and English. Topics include language (idiom, statement, utterance, translation, repetition, rhythm) and history (loss, violence, mourning, inheritance, future, legacy). Course is taught in English. Cross-listed with ARLC 152.

CPLT 154 Introduction to Arabic Philosophy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Arabic philosophical texts. Provides close and literary reading of texts in philosophy, as well as considers the impact these texts have had or can have on Western cultural formation. Cross-listed with ARLC 154, and PHIL 128.

CPLT 155 Introduction to Arabic Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to Arabic literature that focuses on language and rhetoric. Considers major issues such as colonialism, secularism, modernity, language, and the state. Utilizes texts from literature, law, and philosophy. Cross-listed with ARLC 155, and MEIS 155.

CPLT 156 Jews and Arabs 4 Lecture, 3 hours; extra reading, 3 hours Prerequisite(s): upper-division standing or consent of instructor. Traces the formation of the shared and divided history of the Jewish and Arab peoples. Focuses on the literary and institutional dimensions of this history, as well as the formation of related areas of study, such as religion, philosophy, literature, and psychoanalysis. Cross-listed with ARLC 156, MEIS 156, and RLST 156.

CPLT 160 (E-Z) Comparative Cultural Studies: From the Middle Ages to Postmodernism 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Each segment deals with a significant cultural "event" whose implications (historical, political, literary) cross national and cultural boundaries. In order to present a diversity of national and linguistic views, segments are where feasible team taught. F. The French Revolution And Napoleon; G. The Holocaust; M. Millennium And Apocalypse.

CPLT 163 Nationalism and the Novel 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the novel and its role within nationalism as a representative summary or mirror of the nation. Cross-listed with AST 163, and SEAS 163.

CPLT 166 Vietnam and the Philippines 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the comparative national histories of Vietnam and the Philippines by way of great literary works in various genres including poetry, short fiction, and novels. All materials are read in English. Cross-listed with AST 166, VNM 166, and SEAS 166.

CPLT 167 Postcolonial Literature and Criticism in Southeast Asia and South Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores how the theoretical concepts of postcolonial criticism inform and challenge the literature of Southeast Asia and South Asia, as the literature itself pushes the limits of the criticism. Addresses themes of nation, identity, space, gender, home, diaspora, alterity, history, sexuality, transnationalism, neocolonialism, tourism, and education. Cross-listed with AST 167, and SEAS 167.

CPLT 173 (E-Z) International Cinemas 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Considers non-Hollywood cinemas in the national, historical, political, and cultural contexts which produced them. E. Experimental And Avant-garde Film; F. French New Wave; G. New German Cinema; I. Italian Neorealism; T. Third World Cinema; U. Global Perspectives On The Vietnam War. Cross-listed with MCS 173 (E-Z).

CPLT 174 (E-Z) Comparative Studies in Film 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Considers film in the context of the other arts. Compares the treatment of various themes or problems in film and other media. E. Film & Lit In The Avant-garde. Cross-listed with MCS 174 (E-Z).

CPLT 175 Women in African Literature 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor Examines portrayals and discussions of women in African literature from pre-colonial to contemporary times. Focus on selected African writers' presentations of women from pre-colonial to post-independence periods. Considers various perceptions of women in African life and experience.

CPLT 176 The Holocaust in Literature, Film and Culture 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Examines the Shoah, the Hebrew term for the World War II genocide also known as The Holocaust. Reviews texts in multiple genres and media from Europe and Asia. Topics include the following: Resistance and Collaboration; the Role of Women; Hidden Children; The Yellow Star; Concentration Camps; Trauma; and Spectacle. Cross-listed with MCS 176.

CPLT 177 Africa & the Post-Colonial in African Literature 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Studies contemporary African writers' portrayals of Africans' encounters with European and Arab interventions, traumata, and legacies of the two different civilizations in Africa. Promotes close reading of texts and engages contemporary considerations of the meanings of freedom, modernity, and progress.

CPLT 180 (E-Z) Literature and Related Fields 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A critical survey of the theories and methodologies involved in the comparative study of literature and nonliterary fields. E. Literature And History; I. Literature And Institutions; L. Prelaw Readings In Literature; M. Literature And Music; P. Literature And Psychopathology; S. Literature And Science; U. Literature And The Visual Arts; X. Literature And Marxism; Z. Literature And Fiction/fantasy.

CPLT 181 Existentialism in Literature, Film, and Culture 4 Lecture, 3 hours; screening, 2 hours; outside research, .5 hours; term paper, .5 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the Existentialist movement in literature, film, and culture. Texts range from essays, plays, and novels to documentary and fiction film. Topics include choice, subjectivity, and alienation. Cross-listed with FREN 181, and MCS 181.

CPLT 187 Metafiction 4 Lecture, 3 hours; creative writing, take-home midterm, or term paper, 30 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Covers postmodernism, metafiction, and the new novel in Europe and America. Creative writers submit fiction in lieu of a term paper or midterm. Cross-listed with CRWT 187.

CPLT 190 Special Studies 1 to 5 Prerequisite(s): to be taken with the consent of the chair of the Department as a means of meeting special curricular requirements. Course is repeatable .

CPLT 193 Capstone Research Seminar 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; restricted to major(s) Asian Literatures and Cultures, Classical Studies, Comparative Ancient Civiliztns, Comparative Literature, French, Germanic Studies, Lang and Lit/Chinese, Lang and Lit/Classical Studies, Lang and Lit/Comp Ancient Civ, Lang and Lit/Comparative Lit, Lang and Lit/French, Lang and Lit/Germanic Studies, Lang and Lit/Japanese, Lang and Lit/Languages, Lang and Lit/Russian, Language, Russian Studies; or consent of instructor. Develops skills in the formulation and selection of research questions in Comparative Literature. Includes the identification of research questions and the use of primary texts, secondary texts, and theory to seek answers. Addresses techniques in the organization and presentation of writing.

CPLT 195H Senior Thesis 1 to 2 Prerequisite(s): Open by invitation to students in the Honors Program in Comparative Literature. To be taken for two or three consecutive quarters; total credit may not exceed 6 units.

CPLT 196 Senior Research Paper 2 Consultation, 3 hours; term paper, 3 hours. Prerequisite(s): CPLT 193. A continuation of the research project begun in CPLT 193. Conducted under supervision of a faculty advisor in the applicable field of study. Satisfactory (S) or No Credit (NC) grading is not available.

Graduate Courses

CPLT 200 Topics in Southeast Asian Studies 4 Seminar, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An introduction to the world of Southeast Asia and the scholarly discussions about it, with an emphasis on cultural aspects, embedded in their historical context. Materials are in English. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with ANTH 202 and SEAS 200.

CPLT 205 Literature of Southeast Asia 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores themes and theories related to understanding literature and literary culture in Southeast Asia, insisting that the space of literature reaches beyond the text to include all disciplines. Students critically read, engage in, and question discourses of nationhood, identity, loss, mourning , history, and memoir. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with SEAS 205.

CPLT 210 Canons in Comparative Literature 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Studies the concept of the canon and literary texts included in it and excluded from it. Considers the distinction between "mainstream" and "marginal" works. Examines how the canon of texts changes over time.

CPLT 212 Introduction to Graduate Studies in Comparative Literature 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Surveys the history of comparative literature and introduces the beginning graduate student to the various methodologies, aesthetic theories, and critical approaches which have come to dominate its field of inquiry. In addition to class discussion, examinations, and a term paper, students are also involved in a number of practical activities designed to sharpen their critical acumen, enlarge academic vocabulary, and encourage mastery of scholarship procedures.

CPLT 213 Rhetoric and Argument in Ancient China and Greece 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A study of theories and practices of rhetoric, argument, persuasion, and, in some cases, poetics in ancient China and Greece (texts dating from the fifth to the third centuries B.C.), as well as some of their implications for contemporary theory and practice. Students who submit a seminar paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. This course may also be taken on a Satisfactory (S) or No Credit (NC) basis by students advanced to candidacy for the Ph.D. Cross-listed with POSC 213.

CPLT 214 History of Criticism 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; seniors may be admitted by consent of instructor. A survey of critical theories from Plato to modern time through reading and group discussion. Emphasis is on fundamental theoretical issues that recur in the history of literary criticism and are relevant to modern concerns.

CPLT 215A Contemporary Critical Theory 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing Considers representative critical works and movements in contemporary theory. Includes the study of formalism, structuralism, semiotics, psychoanalytic and feminist theory, and deconstruction.

CPLT 215B Issues in Contemporary Theory 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Focuses on a specific problem or movement in contemporary theory. Course is repeatable as content changes.

CPLT 220 (E-Z) German Aesthetic Theory 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. An introduction to individual figures in the history of German aesthetic theory and their legacy in critical discourse. Topics include philhellenism, the beautiful, the sublime, the ugly, fascist chic, mimesis, ornament, the "thing," mechanical reproduction, suddenness, synaesthesia, and technomedia. All readings are in English. E. Kant; F. Benjamin. Course is repeatable as content or topic changes to a maximum of units.

CPLT 221 Film and Literature 4 Seminar, 3 hours; extra Reading, 4 hours; research, 2 hours; screening, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores relationships between film and literature, including adaptation, remakes, translation, novelizations; and literary films as well as cinematic literature. Studies world film and the concepts of national and transnational cinema. Readings include fiction, emphasizing concepts such as narrative framing, intertextuality and genre, and complementary critical and theoretical works.

CPLT 222 Problems in the Pedagogy of Comparative Literature 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Addresses the theories of literary pedagogy and emerging discussions about the teaching of comparative literature.

CPLT 223 Topics in East Asian Literature and Film 4 Seminar, 3 hours; extra reading, 2 hours; research, 1 hours. Prerequisite(s): graduate standing or consent of instructor. Explores East Asian literatures and cinema through critical theory and film studies. Key concepts include colonialism, postcoloniality, Cold War, gender ideology, cultural imperialism, interiority and surface. Focuses on texts that specifically discuss East Asian context and material. Film viewing is required. Taught in English. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topics change to a maximum of 12 units.

CPLT 224 Film Theory 4 Seminar, 3 hours; screening, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced introduction to classic texts of early and contemporary film theory. Discusses theoretical claims of relevant films. Major concepts include realist film theory, cinema of attractions, apparatus theory, theory of film practice, feminist film theory, and notions of gender, race, and class. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CPLT 243 France and Asia: Orientalism and Beyond 4 Seminar, 3 hours; screening, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the phenomenon and concept of Orientalism as well as alternative paradigms for East-West aesthetic and cultural relations through theory, literature, and film. Geographical areas and periods of focus may vary. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CPLT 252 Topics in Tourism, Cultural Authenticity, and the Question of Nostalgia 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces theoretical literature concerning the intertwined notions of tourism, cultural authenticity, and nostalgia. Encourages students to approach written texts and other media from a critical perspective, considering the context of both cultural production and consumption. Valuable to students working on issues such as orientalism, modernity studies, diasporic literature, and postcolonial literature. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes.

CPLT 261 European Modernities 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing Examines theoretical issues of late nineteenth-century European modernities. Utilizes literature, art, and popular images from France, England, Austria, and Russia. Addresses aesthetics, consumption, mass culture, fashion, melodrama, technology, psychology, and nihilism. Includes works by Baudelaire, Zola, Braddon, Boucicault, Turgenev, Manet, Degas, Daumier, and Klimt. Course is repeatable as content changes to a maximum of 12 units.

CPLT 267 Colonialisms and Postcolonial Criticism 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers the historical development of postcolonial criticism and how its theoretical concepts inform and challenge the study of literature and culture. Addresses themes of nation, identity, space, gender, home, diaspora, alterity, history, sexuality, transnationalism, neocolonialism, domestic colonialism, tourism, and education. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CPLT 270 Modern African Literature 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines literary portrayals of colonialism, post-colonialism and independence and their impact on understandings about space, women, gender, individual and communal consciousness, development and national identities in African experience. Includes post-colonial and African feminist thought.

CPLT 277 Seminar in Comparative Literature 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Special topics in comparative literature. Subject may vary from quarter to quarter depending on instructor. Course may be given by visiting faculty. May be repeated.

CPLT 284 Literature, Colonialism, and Religion 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to debates on secularism and religion in Europe. Examines how these debates may illumine perspectives on literary studies and colonialism.

CPLT 290 Directed Studies 1 to 6 Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CPLT 291 Individual Studies in Coordinated Areas 1 to 6 A directed program of study designed to advise and assist candidates who are preparing for examinations. Open to M.A. and Ph.D. candidates. Does not count toward the unit requirement for the M.A. Graded Satisfactory (S) or No Credit (NC). May be repeated quarterly until the qualifying examinations are completed.

CPLT 292 Concurrent Analytical Studies 2 Research, 6 hours. Prerequisite(s): graduate standing; consent of instructor; concurrent enrollment in CPLT 100-series course. To be taken on an individual basis. Student will complete a graduate paper based on research related to the CPLT 100-series course. May be repeated.

CPLT 293 (E-Z) Research Topics in Comparative Literature & Foreign Languages 1 to 6 Research, 3 hours. Prerequisite(s): graduate standing. Provides a means of meeting special curricular needs in literature. Topics include E. English; F. French; G. German; H. Greek; I. Italian; J. Japanese; K. Korean; L. Latin; M. Malay; N. Chinese; O. Vietnamese; P. Filipino; Q. Indonesian; R. Russian; S. Spanish; T. Arabic; U. Comparative Literature. Course is repeatable.

CPLT 299 Research For Thesis Or Dissertation 1 to 12 Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

CPLT 301 Teaching of Foreign Language at the College Level 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign

language classroom. Graded Satisfactory (S) or No Credit (NC).

CPLT 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in Comparative Literature. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Filipino Courses

Subject abbreviation: FIL

Foreign Language Placement Examination
A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors.

No college-level credit may be duplicated. See college placement examination policy.

Lower-Division Courses

FIL 001 First-Year Filipino 4 Lecture, 4 hours. Prerequisite(s): Student must take the Filipino placement examination. An introduction to the sound system and grammar of Filipino. Emphasizes reading, writing, understanding, and speaking. Conducted in Filipino whenever possible.

FIL 002 First-Year Filipino 4 Lecture, 4 hours. Prerequisite(s): FIL 001 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Filipino placement examination as determined by the department faculty. An introduction to the sound system and grammar of Filipino. Emphasizes reading, writing, understanding, and speaking. Conducted in Filipino whenever possible.

FIL 003 First-Year Filipino 4 Lecture, 4 hours. Prerequisite(s): FIL 002 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Filipino placement examination as determined by the department faculty. An introduction to the sound system and grammar of Filipino. Emphasizes reading, writing, understanding, and speaking. Conducted in Filipino whenever possible.

FIL 004 Second-Year Filipino 4 Lecture, 4 hours. Prerequisite(s): FIL 003 with a grade of C- or better; or equivalent or a sufficiently high test score on the Filipino placement examination as determined by department faculty. Emphasizes further development of the four language skills: reading, writing, understanding, and speaking. Conducted primarily in Filipino.

French

Subject abbreviation: FREN

Committee in Charge
Heidi Brevik-Zender, Ph.D., Director, *French/Comparative Literature*
Michelle E. Bloom, Ph.D. *Comparative Literature/French*
Christine Duvergé, Ph.D. *French*
Jennifer Ramos, M.A. *French*
Claire Nettleton, Ph.D. *French*
Daryle Williams, Ph.D, Dean, College of Humanities, Arts, and Social Sciences, ex officio

The department offers the B.A. program in French. The core of the major is the study of French and Francophone literatures and cultures through innovative textual, visual and interdisciplinary approaches.

Students are encouraged to participate in Education Abroad. This is an excellent opportunity to become deeply familiar with another country and its culture while earning academic units toward graduation. Students should plan well in advance to ensure that the courses taken outside of the U.S. fit in their overall program at UCR. Consult the departmental student affairs officer for assistance. For details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Foreign Language Placement Examination
A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

Major

1. **CPLT 001 or CPLT 001W, and 1 lower-division CPLT course (8 units)**
2. **Language proficiency (16 units) - FREN 075, FREN 101A, FREN 101B, FREN 101C**
3. **Eight courses (32 units) of upper-division electives in the French Program.** Of these the student must choose a minimum of five courses (20 units) offered entirely in French. Students may petition to take one course (4 units) outside of the French Program on a related topic. It is strongly encouraged that students take at least one class focusing on a time period earlier than 1800. It is highly recommended that students complete FREN 101B and FREN 101C before enrolling in upper-division electives.
4. **CPLT 193 (4 units). (CPLT 196 strongly recommended but not required)**

Minor

1. **Language proficiency (16 units) - FREN 075, FREN 101A, FREN 101B, FREN 101C**
2. **Two courses (8 units) chosen from among upper-division courses offered entirely in French.**

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Honors Program

Students who wish to undertake a special program of honors study in upper-division courses should apply to the department.

Graduate Programs

Master's Degree

The master's program in French is not currently accepting new students.

Doctoral Degree

Ph.D. studies in French are available through the Ph.D. program in Comparative Literature.

Lower-Division Courses

FREN 001 Introduction to French 4 Lecture, 4 hours. Prerequisite(s): Student must take the French placement examination. An introduction to the sound system and grammar of French. Focuses on the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in French.

FREN 002 Introduction to French 4 Lecture, 4 hours. Prerequisite(s): FREN 001 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of French. Focuses on the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in French.

FREN 003 Introduction to French 4 Lecture, 4 hours. Prerequisite(s): FREN 002 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of French. Focuses on the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in French.

FREN 004 Intermediate French 4 Lecture, 4 hours. Prerequisite(s): FREN 003 with a grade of "C-" or better or equivalent. Continued study of the grammatical structures of French; vocabulary building; and development of reading and compositional skills. Classes conducted in French.

FREN 009A French For Reading Knowledge 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): consent of instructor. A specialized course developing the skill to translate from French into English. No previous knowledge of French is required.

FREN 009B French For Reading Knowledge 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): FREN 009A or consent of instructor. A specialized course developing the skill to translate from French into English. No previous knowledge of French is required.

FREN 015A Introduction to Literature and Culture 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 004 with a grade of "C" or better or consent of instructor. Continued progress towards mastery of the French language. Classes conducted entirely in French.

FREN 015B Introduction to Literature and Culture 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 015A with a grade of "C" or better or consent of Instructor. Continued progress towards mastery of the French language. Classes conducted entirely in French.

FREN 026 Introduction to Literature, Film, and Art By French and Francophone Women 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Analyzes literature, art, and film by French and Francophone women from the 1400s to the present. Topics including marriage, motherhood, war, postcolonial conditions, space, sexual identity, fashion, feminism, and modernity. Studies transnational points of view of French-speaking women from and in Europe, Africa, and Asia. Course taught entirely in English. Cross-listed with CPLT 026.

FREN 045 French Cinema 4 Lecture, 3 hours; discussion, 1 hour; screening, 3 hours. Examines the evolution of French cinema from the beginnings to the present. Emphasizes major themes and directors. Considers genre, film techniques, and concepts including social class, gender, race, nationality, and language. Films are subtitled in English and the course taught entirely in English. Cross-listed with MCS 045.

FREN 075 Oral Proficiency in French 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 004. Provides practice in the development of oral proficiency, fluency of expression, and listening comprehension. Only 4 units may be applied toward the major.

FREN 090 Special Studies 1 to 3 To be taken with the consent of the Chair of the Department as a means of meeting special curricular problems. Course is repeatable.

Upper-Division Courses

FREN 100 Advanced Conversation 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 015B with a grade of "C" or better or equivalent. Provides practice in the development of oral proficiency, fluency of expression, and listening comprehension. Only 4 units may be applied toward the major. Course is repeatable to a maximum of 8 units.

FREN 101A Advanced French Studies 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 015B with a grade of "C" or better or equivalent. Advanced analysis of topics in literature, film, visual arts, or culture. Focuses on the development of written expression in French.

FREN 101B Advanced French Studies 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 101A with a grade of "C" or better or consent of instructor. Advanced analysis of topics in literature, film, visual arts, or culture. Focuses on the development of written expression in French.

FREN 101C Advanced French Studies 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): FREN 101A or FREN 101B with a grade of "C" or better or consent of instructor. Advanced analysis of topics in literature, film, visual arts, or culture. Focuses on the development of written expression in French.

FREN 109 Main Currents in French Literature: Seventeenth- and Eighteenth-Centuries 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): FREN 101A with a grade of C- or better; or consent of instructor. A study of the principal movements in French literature based on the reading of representative works in their entirety.

FREN 112 Mythology in French Literature, Film, and the Visual Arts 4 Lecture, 3 hours; field, 1 hour; research, 1 hour; term paper, 1 hour. Prerequisite(s): FREN 101A with a grade of "C" or better or consent of instructor. Studies myths and mythological figures in seventeenth- through twentieth-century French texts. Focuses on literature (theatre, short stories, and novels), film, painting, and popular culture. Myths include Pygmalion, Venus, Orpheus, Narcissus and Echo, and Icarus. Course conducted in French.

FREN 124 (E-Z) Gender in French Studies 4 Lecture, 3 hours; extra reading, 2 hours; screening, 1 hour. Prerequisite(s): FREN 101A with a grade of C or better. Examines gender issues in French studies including literature, culture, and visual arts. Topics include depictions of women, writing by male and/or female authors, and women in relation to power. Instruction is in French. G. Gender, Race, And Identity Politics; P. Portrayals Of Women In Literature And Film.

FREN 130 Sports in French Literature and Cinema 4 Lecture, 3 hours; screening, 1 hour; research, 1 hour; term paper, 1 hour. Prerequisite(s): FREN 101A or FREN 101B or FREN 101C or consent of instructor. Explores the role of sports in works of fiction from the French speaking world. Utilizes a variety of genres. Topics include the origin of Western sports, fraternity, hygiene, hubris, competition, the making and the fall of heroes, patriotism, doping, capitalism, and propaganda. Taught entirely in French.

FREN 132 Rousseau and Revolution 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory study of the French philosopher and novelist Jean-Jacques Rousseau and the age of revolution in France, Germany, and England. Topics include social inequality, slavery, gender, subjectivity, violence, and political rights. All readings are in English. Cross-listed with CPLT 132, and GER 132.

FREN 143 France and Asia in Literature and the Arts 4 Lecture, 3 hours; screening, 20 hours per quarter; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores French portrayals of Asia in literature, cinema, the other arts, and popular culture. Topics include colonialism, orientalism, gender, race, and language. Cross-listed with CPLT 143.

FREN 148 (E-Z) French Literature of the City 4 Lecture, 3 hours; extra reading, 2 hours; screening, 1 hour. Prerequisite(s): FREN 101A with a grade of C or better. Explores aspects of French literature dealing with city life. Examines visual and cultural material in conjunction with literary works read and discussed. Instruction and reading is in French. S. The Culturof The Paris Suburbs.

FREN 150 (E-Z) Francophone Studies 4 Lecture, 3 hours; research, 1 hour; screening, 1 hour; term paper, 1 hour. Prerequisite(s): FREN 101A with a grade of C or better. Explores the literature, film, and culture of French-speaking countries and regions outside of metropolitan France. Courses taught in French. E. Autobiographies By West African Women; F. Island Literature; W. Writing By And About Women.

FREN 152 Food and French Literature 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): FREN 101A with a grade of "C" or better or consent of instructor. Explores the role of food in French literature. Discusses descriptions of food and concepts such as reading as consuming; food, desire, and sex; gendering of food; cooking, food preparation, recipes, and menus; and food and social class (poverty and wealth). Taught in French.

FREN 153 Children in French Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): FREN 101A with a grade of "C" or better or consent of instructor. Explores the representation of children in French cinema from its inception to the present. Topics include children in the classroom (teachers' pets and troublemakers); outside of school (juvenile delinquents); social class (the underprivileged and well-off); gender; coming of age; and parental roles (child neglect, the maternal/paternal). Conducted in French.

FREN 155 The Bande Dessinee: From Comics to Graphic Novels in French 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): FREN 101A with a grade of "C" or better or consent of instructor. Explores the medium of the Bande Dessinee in its various forms (precursors, comic strips, graphic novels, films). Examines form, content, and their interactions. Focus varies depending on instructor and year. Taught entirely in French.

FREN 156 The Holocaust in French Film, Literature and Graphic Novels 4 Lecture, 3 hours; screening, 1.5 hours; research, 0.5 hour; field, 1 hour. Prerequisite(s): FREN 101A with a grade of C- or better; or consent of instructor. Examines French cinematic and literary representations of the Holocaust.

FREN 160 The Fashion of Modernity 4 Lecture, 3 hours; extra reading, 2 hours; research, 1 hour. Prerequisite(s): FREN 101A with a grade of "C" or better or consent

of instructor. Examines nineteenth-century French modernity as expressed through fashion. Utilizes critical and literary texts, fashion magazines, and films. Topics include the department store, cross-dressing, ready-to-wear, and the rise of the designer. Incorporates work by Baudelaire, Zola, Rachilde, Feydeau, and Maupassant. Course taught in French.

FREN 181 Existentialism in Literature, Film, and Culture 4 Lecture, 3 hours; screening, 2 hours; outside research, .5 hours; term paper, .5 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the Existentialist movement in literature, film, and culture. Texts range from essays, plays, and novels to documentary and fiction film. Topics include choice, subjectivity, and alienation. Cross-listed with MCS 181, and CPLT 181.

FREN 190 Special Studies 1 to 5 To be taken with the consent of the department chair as a means of meeting special curricular problems. Course is repeatable.

FREN 195H Senior Honor Thesis 1 to 4 Consultation, 1 hour; individual study, 3 to 9 hours. Prerequisite(s): invitation by faculty to pursue honors work in French Senior standing. Intensive study and research in consultation with a faculty member, leading to a senior thesis. Grades will be deferred until presentation of the thesis during the final quarter. Satisfactory (S) or No Credit (NC) grading is not available. To be taken during two or three consecutive quarters; repeatable to a maximum of 8 units.

Graduate Courses

FREN 290 Directed Studies 1 to 6 Research, 3- 18 hours. Prerequisite(s): graduate standing. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

FREN 291 Individual Studies in Coordinated Areas 1 to 6 Tutorial, 3 to 18 hours. Prerequisite(s): graduate standing. A program of studies designed to advise and assist candidates who are preparing for examinations. Open to M.A. candidates. Does not count toward the unit requirement for the M.A. May be repeated quarterly until the qualifying examinations are completed. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

FREN 292 Concurrent Analytical Studies in French 2 Research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in a French 100-series course. To be taken on an individual basis. Student completes a graduate paper based on research related to the French 100-series course. Course is repeatable as topics change. FREN 100 and the FREN 101A, FREN 101B, and FREN 101C sequence may not be used for FREN 292.

FREN 299 Research For Thesis Or Dissertation 1 to 12 Prerequisite(s): graduate standing. Research for thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

FREN 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in French. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Germanic Studies

Subject abbreviation: GER

Committee in Charge

John Kim, Ph.D. Director, *Germanic Studies*
Jeffrey Sacks, Ph.D. *Arabic Literature/ Comparative Literature*
Sabine Thuerwaechter, Ph.D. *German/ Comparative Literature*
Heidi Waltz, Ph.D. *Linguistics/Germanic Studies*
Daryle Williams, Ph.D, Dean, College of Humanities, Arts, and Social Sciences, ex officio

The B.A. in Germanic Studies enables a student to specialize in the German language through the acquisition of language competence, as well as exposure to the study of cultural, literary and filmic practices.

Students are encouraged to participate in Education Abroad. This is an excellent opportunity to become deeply familiar with another country and its culture while earning academic units toward graduation. Students should plan well in advance to ensure that the courses taken outside of the U.S. fit in their overall program at UCR. Consult the departmental student affairs officer for assistance. For details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Foreign Language Placement Examination
A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

Major

1. **Lower-division requirements (24 units)**
   a) Sixteen (16) units: GER 001, GER 002, GER 003, GER 004, or equivalents
   b) Eight (8) units: CPLT 001 or CPLT 001W, and 1 lower-division CPLT course
2. **Upper-division requirements (36 units)**
   a) Sixteen (16) units from the following: GER 100, GER 101, GER 102, GER 103A, GER 103B, GER 104, GER 108, GER 172/ PHIL 172
   b) Twenty (20) units as follows:
      (1) Sixteen (16) upper-division units in German literature and film beyond the language proficiency requirement, chosen in consultation with student's advisor.
      (2) CPLT 193 (CPLT 196 strongly recommended but not required)

Minor

1. **Lower-division requirements (16 units) GER 001, GER 002, GER 003, GER 004, or equivalents**
2. **Upper-division requirements (28 units)**
   a) Sixteen (16) units from the following: GER 100, GER 101, GER 102, GER 103A, GER 103B, GER 104, GER 108, GER 172/ PHIL 172
   b) Twelve (12) upper-division elective units in German literature, film, or courses related to Germanic Studies, with approval of the student's advisor.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Honors Program

Students who wish to undertake a special program of honors study in the upper division should apply at the beginning of the junior year. Acceptance for honors study is based on students' previous grade records and the recommendations of their instructors. Candidates for honors must demonstrate superior capacity for independent study and during the senior year are required write an individually directed senior thesis.

Graduate Programs

Master's Degree

The master's program in Germanic Studies is not currently accepting new students.

Doctoral Degree

Ph.D. studies in Germanic Studies are available through the Ph.D. program in Comparative Literature.

Lower-Division Courses

GER 001 Elementary German 4 Lecture, 4 hours. Prerequisite(s): none. An introduction to the sound system and grammar of German. Focuses on the development of the four skills: listening, speaking, reading, and writing. Classes conducted in German as much as possible. Credit is awarded for only one of the following sequences: GER 001, GER 002, and GER 003; GER 010A and GER 010B.

GER 001R German For Reading Knowledge 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. First of an intensive two-quarter sequence providing a comprehensive coverage of basic German grammar. Differs from GER 001 by placing exclusive emphasis on developing the skills of reading and translating German. No previous knowledge of German is required.

GER 002 Elementary German 4 Lecture, 4 hours. Prerequisite(s): GER 001 with a grade of "C-" or better or equivalent. An introduction

to the sound system and grammar of German. Focuses on the development of the four skills: listening, speaking, reading, and writing. Classes conducted in German as much as possible. Credit is awarded for only one of the following sequences: GER 001, GER 002, and GER 003; GER 010A and GER 010B.

GER 002R German For Reading Knowledge 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): GER 001R. Provides the second of a two-quarter sequence of a comprehensive coverage of basic German grammar. Emphasizes developing the skills of reading and translating German.

GER 003 Elementary German 4 Lecture, 4 hours. Prerequisite(s): GER 002 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of German. Focuses on the development of the four skills: listening, speaking, reading, and writing. Classes conducted in German as much as possible. Credit is awarded for only one of the following sequences: GER 001, GER 002, and GER 003; GER 010A and GER 010B.

GER 004 Intermediate German 4 Seminar, 4 hours. Prerequisite(s): GER 003 with a grade of C- or better or GER 010B with a grade of C- or better or equivalent. Involves a grammar review combined with introductory readings of contemporary authors. Develops active language skills through readings, audiovisual media, and field trips.

GER 010A Accelerated German 6 Lecture, 4 hours; discussion, 2 hours. Prerequisite(s): none. Accelerated study of German. The GER 010A and GER 010B sequence is equivalent to the GER 001, GER 002, and GER 003 sequence including the four basic skills of listening, speaking, reading, and writing. Credit is awarded for only one of the GER 001, GER 002, and GER 003 or GER 010A and GER 010B sequences.

GER 010B Accelerated German 6 Lecture, 4 hours; discussion, 2 hours. Prerequisite(s): GER 010A with a grade of "C-" or better or equivalent. An accelerated study of German that covers the four basic skills of listening, speaking, reading, and writing. Credit is awarded for only one of the following sequences: GER 001, GER 002, and GER 003; GER 010A and GER 010B.

GER 045 Introduction to German Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Introduction to the history of German cinema from the advent of the studio system to the present. Covers film in Germany, Switzerland, and Austria. Attention is paid to the work of German-speaking filmmakers living in other parts of the world. Instruction is in English; all films have subtitles. Cross-listed with MCS 042.

GER 046 Representing the Holocaust in Words and Images 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Introduces representations of the Holocaust in documentary and narrative film, literature, and painting. Explores notions such as memory, mourning, trauma, spectatorship, and atrocity to come to terms with different responses to the Holocaust. Topics include memorialization, stigmatization, the ethics of historical representation, and black humor. Cross-listed with CPLT 046.

GER 090 Special Studies 1 to 3 To be taken with the consent of the department chair as a means of meeting special curricular problems. Course is repeatable.

Upper-Division Courses

GER 100 Introduction to German Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): GER 004; or consent of instructor. Involves reading and analysis of literary texts within a literary-historical framework. Seeks to familiarize the beginning student of literature with the main currents, representatives, and genres of modern German literature. Language of instruction is German.

GER 101 German Conversation 4 Lecture, 4 hours. Prerequisite(s): GER 004 or equivalent. Involves development of active control of the language with discussion and oral presentation of assigned topics. Supervised work in German phonetics.

GER 102 Contemporary German Cinema For Conversation 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): GER 004 or consent of instructor. Utilizes a series of German language films to connect cultural background and historical contexts with linguistic aspects. Topics include The Wall, reunification, Turkish-German relationships, and heritage films. Class conducted in German.

GER 103A Advanced Composition and Conversation 4 Lecture, 4 hours. Prerequisite(s): GER 004 or consent of instructor. Emphasis is on the mastery of the subtleties of the German language, including conversation, reading, listening, and writing. Reinforces oral and written skills through exposure to and analysis of a broad range of texts, essay writing, and oral presentations.

GER 103B Advanced Composition and Conversation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): GER 004; or consent of instructor. Improves oral and written proficiency of the German language. Emphasizes reading increasingly difficult material, conversational use of German, vocabulary building, and study of idioms. Materials include newspaper articles and television programs that explain the German educational system, the arts, history, and politics.

GER 104 Intro to German Cultural History For Conversation 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): GER 004 or equivalent. Introduces German cultural history through conversation and composition in German. Organized thematically around politics, philosophy, music, art, and architecture. Class conducted in German.

GER 107 German Drama in Translation: Theater of Revolution / Theater as Revolution 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the influence of drama and stage on society and their role in disseminating philosophical ideas and aiding social change. Topics include the medieval Carnival play, theater of the Enlightenment and the Sturm und Drang, 19th century Realism and social drama, and Epic Theater.

GER 108 The Art of Translation 4 Lecture, 1 hour; discussion, 3 hours. Prerequisite(s): GER 101 or GER 103A or GER 103B or consent of instructor. Examines theories of translation, including recognized examples of good and bad translations. Provides an opportunity to put theory into practice.

GER 109 Masterworks of German Literature in Translation: Plays, Nineteenth-Century Realism to the 1960s 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing Provides an introduction to the great contribution of German letters to world literature.

GER 111 Berlin Metropolis in Literature, Film, Music, and Art 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An introduction to the metropolis Berlin as a gateway between the East and West. Explores topography of the city through film, art, music, and literary texts. Considers Berlin's dramatic transformations as a microcosm of Germany and Europe's troubled history in the twentieth century. Course conducted in English. Cross-listed with AHS 120, CPLT 111, EUR 120, and MCS 178.

GER 118 (E-Z) Topics in German Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Study of selected films, directors, and movements in German film. Films are in German with English subtitles. No knowledge of German is required. Cross-listed with MCS 118 (E-Z).

GER 118E Weimar Cinema and After 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An investigation of the silent and sound films of the Weimar era, focusing on the works of Fritz Lang, G. W. Pabst, and F. W. Murnau and their impact on film directors such as Werner Herzog and Rainer W. Fassbinder. Includes readings in film theory and in the literature and cultural history of the period. Cross-listed with MCS 118E.

GER 118F The Cinema of Fritz Lang 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. In-depth study of the films of the Austrian-born director Fritz Lang (1890-1976), whose work spans the silent era, the Golden Age of Hollywood, and postwar Germany. Explores the evolution of film technique, changes in cinematic paradigms, and Lang's engagement with ideology. Cross-listed with MCS 118F.

GER 118G Film and the Holocaust 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the moral, philosophical, and cultural legacy of the Holocaust in documentary and narrative films. Films and selected theoretical and literary texts involve key issues such as truthfulness, politicization, marginalization, universalization, trivialization, abstraction, representation of trauma, abstraction, aestheticization, and testimonies. Cross-listed with MCS 118G.

GER 119 Vienna in Film 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): Restricted to class level standing of Junior, or Senior; Or the consent of instructor; Explores employment of cityscape as a narrative device while introducing some of the politics, culture, and technology that influenced late 19th and early 20th century Viennese society. Considers the filmmaker's usage of landscape, architecture, culture, art, history, politics and population. Taught in English with either English language or German/subtitled film.

GER 124 Nordic Mythology, Folklore, and Fairytales 4 Seminar, 3 hours; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the representation of animals, plants, and other appearances of the natural world such as sunrise and sunset in European creation and destruction mythology, fairytales, and folklore. Cross-listed with EUR 124.

GER 125 German Fairy Tales: From Brothers Grimm to Hollywood 4 Lecture, 3 hours; screening, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores German and European folk and fairy tales from the 18th and 19th centuries, their precursors, and their later variations and receptions in oral, literary, and media cultures of the past and present. Includes their role in American popular culture through adaptations by Disney and Hollywood. Cross-listed with CPLT 125, and EUR 125.

GER 126 From Novel to Screen: Film Adaptations of German Literature 4 Lecture, 3 hours; screening, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to classic works of German literature and their film adaptations. Explores adaptations by film directors such as Welles, Kubrick, Visconti, and Fassbinder. Studies the nexus between literature, film, and theatre. Course conducted in English. Cross-listed with CPLT 126, and MCS 126.

GER 131 Marx, Nietzsche, Freud 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Critical introduction to three central thinkers of modernity. Topics include alienation, free will, revolution, the unconscious, sexual difference, political power, and the modern conception of truth. Readings and discussions are in English. Selected readings are in German for German majors and minors. Cross-listed with CPLT 131.

GER 132 Rousseau and Revolution 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory study of the French philosopher and novelist Jean-Jacques Rousseau and the age of revolution in France, Germany, and England. Topics include social inequality, slavery, gender, subjectivity, violence, and political rights. All readings are in English. Cross-listed with CPLT 132, and FREN 132.

GER 134 Cinematic War Memory 4 Lecture, 3 hours; screening, 2 hours; extra reading, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines cinematic confrontations involving World War II in Germany and Japan. Topics include desire between victims and perpetrators, representation of trauma, and ethical responsibility. All screenings have English subtitles. Cross-listed with CPLT 134, MCS 114, and JPN 134.

GER 136 The Enlightenment and its Consequences: Modern Europe in the Arts 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the basic ideas of modernity in Europe that are central to the history of western cultures and civilization. Focuses on the function of the arts and sciences in relation to the philosophy and concepts of the Enlightenment. Addresses humankind's changing relationship to religion, state, society, and history, as well as new strategies of self-reflection. Cross-listed with CPLT 136.

GER 137 Passions, Apparitions, and Automata 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory study of German Romanticism from its origins in Goethe to its development in Hoffmann. Topics include madness, sexual desire, doppelganger, homicide, and automata. All readings are in English; selected readings are in German for German majors and minors. Cross-listed with CPLT 137, and EUR 137.

GER 163 Modern German History Through Film 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores twentieth-century German history through film. Includes World Wars I and II, inflation and polarization of classes, Nazi Germany, representations of the Holocaust, and a divided and reunited Germany. Cross-listed with MCS 115, HISE 163, and CPLT 115.

GER 172 Reading Philosophical German 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): GER 002R or GER 004 or consent of instructor. Develops reading strategies and translation skills for German philosophical texts through a review of grammar and readings in the original language. Prepares for a graduate-level translation exam and independent research in German. Intermediate to advanced German reading proficiency required; familiarity with German philosophical works is recommended but not required. Cross-listed with PHIL 172.

GER 173 The Age of Goethe 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the mature work of Goethe against the dual backdrops of Klassik and Romantik. Considers works by Schiller, Kleist, Holderlin, the Schlegels, and E.T.A. Hoffmann in analysis of early nineteenth-century literary currents in Germany.

GER 185 Currents in Modern German Literature 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Analysis and interpretation of such major modern writers as Brecht, Mann, and Kafka.

GER 190 Special Studies 1 to 5 Tutorial, 1 to 4 hours. Prerequisite(s): graduate standing. To be taken with the consent of the department chair as a means of meeting special curricular problems. Course is repeatable.

Graduate Courses

GER 290 Directed Studies 1 to 6 Prerequisite(s): graduate standing. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GER 291 Individual Studies in Coordinated Areas 1 to 6 Prerequisite(s): graduating standing. A program of studies designed to advise and assist candidates who are preparing for examinations. Open to M.A. and Ph.D. candidates. Does not count toward the unit requirement for the M.A. Graded Satisfactory (S) or No Credit (NC). May be repeated quarterly until the qualifying examinations are completed.

GER 292 Concurrent Analytical Studies 2 Research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in German 100-series course. To be taken on an individual basis. Student will complete a graduate paper based on research related to the German 100-series course. Course is repeatable with different topic.

GER 299 Research For Thesis Or Dissertation 1 to 12 Prerequisite(s): graduate standing. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

CPLT 301 Teaching of Foreign Language at the College Level 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

GER 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 units. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in German. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Italian Studies Minor

Subject abbreviation: ITAL
College of Humanities, Arts, and Social Sciences

Committee in Charge

Jeffrey Sacks, Ph.D., Chair
Erith Jaffe-Berg (Theater)
Jeanette Kohl (Art History)
Marina Pianca (Hispanic Studies, Emeritus)
Daryle Williams, Ph.D, Dean, College of Humanities, Arts, and Social Sciences, ex officio

Students are encouraged to participate in Education Abroad. This is an excellent opportunity to become deeply familiar with another country and its culture while earning academic units toward graduation. Students should plan well in advance to ensure that the courses taken outside of the U.S. fit in their overall program at UCR. Consult the departmental student affairs officer for assistance. For details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Minor

The Italian Studies minor offers students the opportunity to attain an advanced level of proficiency in Italian language while taking a number of discipline-based courses that concentrate on Italian themes. The minor complements liberal arts degrees in many aspects of Western or European studies, including art history, history, philosophy, political science, and religious studies.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog.

Requirements for the minor consist of 24 units, distributed as follows:

1. **Lower Division Requirements (4 units plus language proficiency)**
   a. Proficiency in Italian through the Intermediate Level in either: (1) ITAL 001, ITAL 002, ITAL 003, ITAL 004; or (2) ITAL 020A, ITAL 020B, ITAL 004; or (3) equivalent.
   b. Four (4) units from lower-division lecture courses on Italian literature, film, and/or culture offered by the Department of Comparative Literature and Languages.
2. **Upper Division Requirements (20 units)**
   a. Eight (8) units of ITAL 101A and ITAL 101B.
   b. Eight (8) units of upper-division courses in Italian literature, film, and/or culture offered by the Department of Comparative Literature and Languages.
   c. Four (4) units of upper-division courses in Italian art history, history, film, theatre, or another related discipline (may be offered by the Department of Comparative Literature and Languages or by another department) and approved by the student's advisor.

Foreign Language Placement Examination
A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

Lower-Division Courses

ITAL 001 Elementary Italian 4 Lecture, 4 hours. Prerequisite(s): none. An introduction to the sound system and grammar of Italian focusing on the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in Italian insofar as possible. Audio-lingual and media-based learning materials available in the Media Library. Credit is awarded for only one of the following sequences: ITAL 001, ITAL 002, and ITAL 003; ITAL 020A and ITAL 020B.

ITAL 002 Elementary Italian 4 Lecture, 4 hours. Prerequisite(s): ITAL 001 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of Italian focusing on the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in Italian insofar as possible. Audio-lingual and media-based learning materials available in the Media Library. Credit is awarded for only one of the following sequences: ITAL 001, ITAL 002, ITAL 003; ITAL 20A and ITAL 20B.

ITAL 003 Elementary Italian 4 Lecture, 4 hours. Prerequisite(s): ITAL 002 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of Italian focusing on the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in Italian insofar as possible. Audio-lingual and media-based learning materials available in the Media Library. Credit is awarded for only one of the following sequences: ITAL 001, ITAL 002, ITAL 003; ITAL 020A and ITAL 020B.

ITAL 004 Intermediate Italian 4 Lecture, 4 hours. Prerequisite(s): ITAL 003 or ITAL 020B with a grade of "C-" or better or equivalent. Continued study of the basic grammatical structures of Italian emphasizing competency in reading, writing, and speaking. Involves reading varied materials (literary and journalistic) dealing with contemporary Italy.

ITAL 020A Elementary Italian For Spanish Speakers 4 Lecture, 4 hours. An introductory course on the fundamental skills of speaking, reading, writing, and comprehending Italian for those acquainted with Spanish. Emphasizes comparing and contrasting Italian and Spanish grammatical constructions. Conducted entirely in Italian. Credit is awarded for only one of the following sequences: ITAL 001, ITAL 002, and ITAL 003; ITAL 020A and ITAL 020B

ITAL 020B Elementary Italian For Spanish Speakers 4 Lecture, 4 hours. Prerequisite(s): ITAL 020A with a grade of C- or better; or placement test; or consent of instructor. An introductory course on the fundamental skills of speaking, reading, writing, and comprehending Italian for those acquainted with Spanish. Emphasizes comparing and contrasting Italian and Spanish grammatical constructions. Conducted entirely in Italian. Credit is awarded for only one of the following sequences: ITAL 001, ITAL 002, and ITAL 003; ITAL 020A and ITAL 020B

ITAL 042 Italian Americans: Voices and Visions 4 Lecture, 3 hours; screening, 2 hours; written work, 1 hour. Prerequisite(s): none. A study of the Italian American experience as seen through major works of Italian and Italian American writers and filmmakers. Covers the 1950s to the present. No knowledge of Italian required. Cross-listed with EUR 042

ITAL 043 Italian Cuisine and Literature Through the Centuries 4 Lecture, 3 hours; screening, 2 hours; written work, 1 hour. Prerequisite(s): none. Analyzes the relationship between food and literature in Italian culture through the study of gastronomic and literary texts from the Roman to present times. Cross-listed with EUR 043

ITAL 044 Mafia and Malavita in Italian Literature and Film 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A study of the history of malavita in the Italian peninsula. Explores topics from mischievous transgression to organized crime and Mafia as presented through the works of renowned Italian writers and directors. No knowledge of Italian required. Cross-listed with EUR 044.

ITAL 045 Italian Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Covers major works of the Italian cinema from Neo-Realism to the present. Emphasizes the historical evolution and representation of major elements of Italian culture. Knowledge of Italian not required. Cross-listed with MCS 044.

ITAL 048 Italian Culture and Civilization 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. An introduction to the concept of Italy and its geographical, historical, and cultural changes from the Middle Ages to the present as seen through the works of renowned writers, artists, and film directors. No knowledge of Italian required. Cross-listed with EUR 048.

ITAL 090 Special Studies 1 to 3 To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable.

Upper-Division Courses

ITAL 101A Advanced Italian 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ITAL 004 with a grade of "C" or better or equivalent. Advanced Italian grammar and conversation. Emphasizes mastery of the subtleties of the language in conversation, reading, and writing.

ITAL 101B Advanced Italian 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ITAL 101A. Advanced Italian grammar and conversation. Emphasizes mastery of the subtleties of the language in conversation, reading, and writing.

ITAL 101C Advanced Italian 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ITAL 101B or equivalent. Advanced Italian grammar and conversation. Emphasizes mastery of the subtleties of the language in conversation, reading, and writing.

ITAL 139 The Divine Comedy 4 Lecture, 3 hours; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A close reading of Dante's "Divine Comedy" using a bilingual edition. Focuses on conceptual and aesthetic questions. Although the work is read in English, students without previous knowledge of Italian are given some instruction in it to enable them to understand parts of the original work. Cross-listed with CPLT 139 and EUR 139.

ITAL 140 Italian Literature of the Holocaust in Translation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores the experiences of Italian Jews during Fascism. Analyzes the attitudes of the Fascist regime, Italian people, and the Catholic Church as seen through the works of renowned Italian writers and directors. Course taught in English. Cross-listed with EUR 140.

ITAL 150 Italian Theatre 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A study of the development of Italian theatre from the commedia dell'arte to the present. Discusses works by Ruzzante, Machiavelli, Metastasio, Goldoni, Alfieri, Verga, Pirandello, Fo, and Rame. Includes videos of plays, melodramas, and operas. No knowledge of Italian required. Cross-listed with EUR 150.

ITAL 158 Italian Literature in the Period of Unification 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): Restricted to class level standing of junior, or senior. A study of nineteenth-century Italian literature. Emphasizes the pre-Unification "Risorgimento" period through the works of Foscolo, Leopardi, Pellico, and Manzoni. No knowledge of Italian required. Cross-listed with EUR 158

ITAL 162 Contemporary Italian Women Writers in Translation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Focuses on works by Italian women writers addressing issues of gender and sexuality in Italian historical and cultural contexts such as Fascism, the cultures of Sicily and Sardinia, and the North/South divide. Explores intersectionalities of region, class, and gender with emphasis on the undoing of fascist and patriarchal aesthetics.

ITAL 185 Modern and Contemporary Italian Literature in Translation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; Considers selected works by authors who exemplify major cultural and literary trends in Italy from the period of unification (1860s) to the present. Readings are supplemented by viewing of films. No knowledge of Italian is required. Cross-listed with EUR 185.

ITAL 190 Special Studies 1 to 5 Prerequisite(s): To be taken with the consent of the chair of the department as a means of meeting special curricular problems.

Graduate Courses

CPLT 290 Directed Studies 1 to 6 Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ITAL 292 Concurrent Analytical Studies 2 Research, 6 hours. Prerequisite(s): consent of instructor; concurrent enrollment in Italian 100-series course. To be taken on an individual basis. Student will complete a graduate paper based on research related to the Italian 100-series course. May be repeated with different topic.

Professional Courses

CPLT 301 Teaching of Foreign Language at the College Level 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

ITAL 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 units. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in Italian. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Japanese

Subject abbreviations: JPN

Committee in Charge

Anne McKnight, Director, Ph.D., *Japanese/Comparative Literature*
John N. Kim, Ph.D., *German/Japanese/Comparative Literature*
Traise Yamamoto, Ph.D,. *English/Asian American Literary and Cultural Studies*
Setsu Shigematsu, Ph.D., *Media and Cultural Studies*
Daryle Williams, Ph.D, Dean, College of Humanities, Arts, and Social Sciences, ex officio

Major

The Japanese Major enables students to acquire advanced proficiency in the Japanese language and to develop critical thinking skills in their analysis of Japanese literary, filmic, and social texts. Students are encouraged to study in Japan through the University of California's numerous Education Abroad Programs.

1. **Lower-division requirements (16 units plus language proficiency)**
   a) Proficiency in Japanese through the intermediate level (JPN 006 or its equivalent)
   b) Eight (8) units from lower-division lecture courses on Japanese literature and culture: AST 022/JPN 022/MCS 022, AST 023/CPLT 023/JPN 023, AST 032/JPN 032, AST 034/JPN 034, AST 056/CPLT 056/JPN 056, JPN 035. and any other lower-division lecture courses on Japanese literature, culture, and film chosen in consultation with the student's advisor.
   c) Eight (8) units from CPLT 001 or CPLT 001W, and 1 lower-division CPLT course.
2. **Upper-division requirements (36 units)**
   a) Twelve (12) upper-division units in Japanese language from JPN 101A, JPN 101B, JPN 101C, JPN 110. Students whose proficiency exceeds the 101 series should take the 12 required units by taking 110 more than once, by using EAP language courses, or, under the JPN 190 rubric, by converting an existing "content" course into a language course with the instructor's help.
   b) Twenty (20) units in upper-division Japanese literature and culture from AST 150/JPN 150, AST 151/JPN 151, AST 152 (E-Z)/JPN 152 (E-Z), AST 153 (E-Z)/JPN 153 (E-Z), AST 184/JPN 184, AST 190, CPLT 134/GER 134/JPN 134/MCS 134, CPLT 142J/GSST 142J, CPLT 145/JPN 145, JPN 110, JPN 190, KOR 112, and any other upper-division lecture courses on Japanese literature, culture, and film chosen in consultation with the student's advisor.
   c) Four (4) units in CPLT 193. (CPLT 196 strongly recommended but not required)

Japanese Minor

The Japanese Minor enables students to acquire intermediate proficiency in the Japanese language and to develop critical thinking skills in their analysis of these literary, filmic, and social texts. Students are encouraged to study in Japan through the University of California's numerous Education Abroad Programs.

1. **Lower-division requirements (4 units plus language proficiency)**
   a) Proficiency in Japanese through the intermediate level (JPN 006 or its equivalent)
   b) Four (4) units from lower-division lecture courses on Japanese literature and culture: JPN 022/AST 022/MCS 022, JPN 023/AST 023/CPLT 023, JPN 034/AST 034, JPN 035, JPN 056/AST 056/CPLT 056, and any other lower-division lecture courses on Japanese literature, culture, and film chosen in consultation with the student's advisor.
2. **Upper-division requirements (20 units)**
   a) Eight (8) upper-division units in Japanese language from: JPN 101A, JPN 101B, JPN 101C, JPN 110. Students whose proficiency exceeds the 101 series should take the 8 required units by taking JPN 110 more than once, by using EAP language courses, or, under the JPN 190 rubric, by converting an existing "content" course into a language course with the instructor's help.
   b) Twelve (12) units in Japanese literature and culture from: AST 190, CPLT 142J/GSST 142J, JPN 110, JPN 134/CPLT 134/GER 134/MCS 114, JPN 145/CPLT 145, JPN 150/AST 150, JPN 152 (E-Z)/AST 152 (E-Z), JPN 153 (E-Z)/AST 153 (E-Z), JPN 154 (E-Z)/AST 154 (E-Z), JPN 184/AST 184/MCS 184, JPN 190, and any other upper-division lecture courses on Japanese literature, culture, and film chosen in consultation with the student's advisor.

Japanese Courses

Foreign Language Placement Examination
A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

Lower-Division Courses

JPN 001 First-Year Japanese 4 Lecture, 4 hours. Prerequisite(s): Student must take the Japanese placement examination. An introduction to the sound system and grammar of Japanese. Emphasizes speaking, reading, writing, and comprehension skills. Classes conducted in Japanese whenever possible.

JPN 002 First-Year Japanese 4 Lecture, 4 hours. Prerequisite(s): JPN 001 with a grade of C- or better; or equivalent. An introduction to the sound system and grammar of Japanese with emphasis on speaking, reading, writing, and understanding. Classes conducted in Japanese insofar as possible.

JPN 003 First-Year Japanese 4 Lecture, 4 hours. Prerequisite(s): JPN 002 with a grade of C- or better; or equivalent. An introduction to the sound system and grammar of Japanese with emphasis on speaking, reading, writing, and understanding. Classes conducted in Japanese insofar as possible.

JPN 004 Second-Year Japanese 4 Lecture, 4 hours. Prerequisite(s): JPN 003 with a grade of C- or better; or equivalent. Introduces levels of speech and emphasizes reading and writing of advanced prose.

JPN 005 Second-Year Japanese 4 Lecture, 4 hours. Prerequisite(s): JPN 004 with a grade of C- or better. Concentrates on advanced speech levels and their cultural underpinnings.

JPN 006 Second-Year Japanese 4 Lecture, 4 hours. Prerequisite(s): JPN 005 with a grade of C- or better. Emphasizes the academic style of written and spoken Japanese and academic comprehension of the cultural background.

JPN 022 Introduction to Japanese Film 4 Lecture, 3 hours; discussion, 1 hour; screening, 2 hours. An introduction to major genres, styles, and creators in the Japanese film world. Focuses on formal analysis and critical writing about film. Works studied range from the samurai epics of Kurosawa to recent anime. All films have subtitles. No previous knowledge of Japanese language or culture required. Cross-listed with AST 022, and MCS 022.

JPN 023 Modern Japan and Personal Narrative 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1.5 hours. Introduces major debates in history, politics, and culture through the genres of biography, autobiography, diary, and confession. Explores the parallel construction of the modern nation, the modern language, and the modern self. Traces the development of Japan's "I-novel." Builds skills in close reading by studying the rhetoric of self-narrative. Cross-listed with AST 023, and CPLT 023.

JPN 034 Introduction to Classical Japanese Literature 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. A survey of some of the more famous works of pre-modern Japanese literature from 10th century poetry collections to 18th century puppet plays. Focuses on the relationship among aesthetics, politics, language, and gender. Assignments include manga translations, creative writing, and intensive Web research. Cross-listed with AST 034.

JPN 035 Modern Japanese Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to Japanese culture and society with emphasis on the day-to-day lives of the modern Japanese people at home, work, and play.

JPN 037 Otaku Worldwide: the Globalization of Japanese Media and its Subcultures 4 Lecture, 3 hours; written work, 2 hours; extra reading, 1 hour. Prerequisite(s): none. Explores the historical contingency of subcultures, key moments in the evolving discourse on 'otaku' both within and outside Japan, and considers how the term is used to identify consumers and fan cultures. Explores how manga and anime reflect class, gendered, and erotic resistance to dominant political structures. Cross-listed with CPLT 037.

JPN 056 Cultures of the Japanese Empire 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers the social histories and literatures of the Japanese Empire from the foundation of the Meiji state to the present. Includes the Ainu, Okinawan, Taiwanese, and Korean cultures. Explores the concepts of assimilation, citizenship, national language, nation-state, sovereignty, total war, and translation. Utilizes readings in English. Cross-listed with AST 056, and CPLT 056.

JPN 090 Special Studies 1 to 5 Individual Study, 3 to 15 hours. To be taken with the consent of the Chair of the Department as a means of meeting special curricular problems in either language or literature.

Upper-Division Courses

JPN 101A Third-Year Japanese 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): JPN 006 with a grade of C- or better. Further development of students' reading, writing, listening and speaking skills in Japanese. Course conducted in Japanese.

JPN 101B Third-Year Japanese 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): JPN 101A with a grade of C- or better. Further development of students' reading, writing, listening and speaking skills in Japanese. Course conducted in Japanese.

JPN 101C Third-Year Japanese 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): JPN 101B with a grade of C- or better. Emphasizes the academic style of written and spoken Japanese and academic comprehension of the cultural background.

JPN 110 Advanced Reading in Japanese 4 Lecture, 3 hours; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): previous or concurrent enrollment in JPN 101C or equivalent. Reading of extended authentic texts in Japanese. Texts may include newspaper or magazine articles, literature, or nonfiction. Emphasis may extend to translation, textual analysis, basic research using primary sources, or discussion of texts in Japanese. Course is repeatable as content changes.

JPN 116 Japan and its Others 4 Lecture, 3 hours; extra reading, 1 hour; outside research, 1 hour; written work, 1. Prerequisite(s): upper-division standing or consent of the instructor. Studies gender/race/ethnic/sexual politics and minority cultural productions in modern Japan. Explores the historical backgrounds/epistemology of minority politics in Japan. Introduces the vibrant yet underprivileged voices of minority subjects. Includes LGBTQ

issues, Zainichi Koreans, Ainu, Okinawa, Abelism, and the Buraku caste system. Cross-listed with CPLT 116.

JPN 120 Remediating Japan: Genre, Adaptation and Media Forms 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): CPLT 001 with a grade of C- or better or CPLT 002 with a grade of C- or better or CPLT 017 with a grade of C- or better or JPN 022 with a grade of C- or better or JPN 023 with a grade of C- or better or JPN 034 with a grade of C- or better; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introduces theories and examples of adaptation and remediation from Japanese culture. Includes literature to film adaptation, video game adaptation, uses of folk literature in performing arts, and cross-media franchises.

JPN 134 Cinematic War Memory 4 Lecture, 3 hours; screening, 2 hours; extra reading, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines cinematic confrontations involving World War II in Germany and Japan. Topics include desire between victims and perpetrators, representation of trauma, and ethical responsibility. All screenings have English subtitles. Cross-listed with CPLT 134, MCS 114, and GER 134.

JPN 145 Modern Japanese Thought 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of modern Japanese thought from a theoretical and intellectual historical perspective. Topics include philosophical discussions of modernization, "Westernization," nationalism, colonialism and imperialism, "comfort women," Japanese war crimes in continental Asia, the American bombing of Hiroshima and Nagasaki, post-World War II remembrance and denial. All readings are in English. Cross-listed with CPLT 145.

JPN 150 In Women's Hands: Reading Japanese Women Writers 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines major works of Japanese women writers from Heian (ninth century) to contemporary, focusing on themes, genres, representations of gender, ideas of love and romance, and feminine aesthetics. Readings include fiction, poetry, essays, and drama, with the main emphasis on fictional writing. Classes are conducted in English. Cross-listed with AST 150.

JPN 152 (E-Z) Themes in Modern Japanese Literature 4 Lecture, 3 hours; written work, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to modern Japanese literature in translation as seen through the lens of a particular theme or issue. Explores works in English translation; optional readings in Japanese may be offered. E. The End Of The World In Japanese Fiction; G. Love And Death; J. Classics And Canon; K. Dreams And Other Virtual Worlds; M. Food In Japanese Literature And Film. Cross-listed with AST 152 (E-Z).

JPN 153 (E-Z) Themes in Early Japanese Literature 4 Lecture, 3 hours; written work, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to early Japanese literature as seen through the lens of a particular theme or issue. Explores works in English translation. E. Supernatural Japan; F. Warrior Japan; G. The Culture Of The Floating World: Tokugawa Period Literature, Drama, And Art. Cross-listed with AST 153 (E-Z).

JPN 154 (E-Z) Themes in the Folklore and Popular Culture of Japan 4 Lecture, 2 hours; discussion, 1 hour; extra reading, 1 hour; written work, 2 hours. Topics include myth, legend, folktale, folk performance, festival, ritual, and the development of popular or commercial culture. Considers literary versus oral tradition, ethnic identity, authenticity, nationalism, modernity, commodification, and the invention of tradition. E. Ancient Myth To Contemporary Legend: A Study Of Japanese Folk Narrative; F. History Of Japanese Popular Culture. Cross-listed with AST 154 (E-Z).

JPN 180 Japanese Documentary 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Studies the history of Japanese documentary cinema. Teaches strategies for reading nonfiction visual narrative. Explores other forms of documentation controversial in modern Japanese history including oral testimony, photography, and internet activism. Topics may include war, war protest, peace activism, environmental activism, nuclear politics, and green energy. Course is repeatable as topics and instructor change to a maximum of 8 units. Cross-listed with AST 180, and MCS 180.

JPN 184 Japanese Media and Cultural Studies 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates Japanese media and culture including film, television, video games, manga (comics), anime, music, and print and digital media. Analyzes the function of media relating to issues of national identity, imperial culture, collective memory, and censorship. Includes transnational circulation of Japanese cultural forms, alternative media, and historical changes in technologies. Cross-listed with AST 184, and MCS 184.

JPN 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): upper-division standing or consent of instructor. To be taken with the consent of the Chair of the Department as a means of meeting special curricular problems in either language or literature. Course is repeatable.

Korean Minor

The Korean minor provides students with the knowledge of Korean language, literature, culture, and society.

1. **Lower-division requirements (8 units plus language proficiency)**
   a) Proficiency in Korean through the intermediate level, KOR 005 (second year)
   b) Eight (8) units from lower-division lecture courses on Korean literature and culture: KOR 042, KOR 047/AST 047/MCS 047
2. **Upper-division requirements (16 units)**
   a) Four (4) upper-division units in Korean language from KOR 101
   b) Eight (8) units in Korean literature and culture from KOR 110 (E-Z), KOR 112/AST 112, Four (4) units in Asian literatures and cultures: can be chosen from all the upper-division lecture courses on Asian literature and culture from the department as well as Korea-related upper-division courses from other departments (with adviser's consent), including the courses listed under (2)

Korean Courses

Foreign Language Placement Examination
A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

Lower-Division Courses

KOR 001 First-Year Korean 4 Lecture, 4 hours. Prerequisite(s): Student must take the Korean placement examination. An introduction to the sound system and grammar of Korean. Emphasizes reading, writing, understanding, and speaking. Credit is awarded for only one of the following sequences: KOR 001, KOR 002, KOR 003, and KOR 004; KOR 001, KOR 002, and KOR 020B; KOR 020A and KOR 020B

KOR 002 First-Year Korean 4 Lecture, 4 hours. Prerequisite(s): KOR 001 with a grade of C- or better; or equivalent. An introduction to the sound system and grammar of Korean with emphasis on reading, writing, understanding, and speaking. Credit is awarded for only one of the following sequences: KOR 001, KOR 002, KOR 003, and KOR 004; KOR 001, KOR 002, and KOR 020B; KOR 020A and KOR 020B.

KOR 003 First-Year Korean 4 Lecture, 4 hours. Prerequisite(s): KOR 002 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of Korean with emphasis on reading, writing, understanding, and speaking. Credit is awarded for only one of the following sequences: KOR 001, KOR 002,

KOR 003, and KOR 004; KOR 001, KOR 002, and KOR 020B; KOR 020A and KOR 020B.

KOR 004 Second-Year Korean 4 Lecture, 4 hours. Prerequisite(s): KOR 003 with a grade of C- or better. A continuation of Korean language study. Emphasizes reading, writing, grammar, and conversation. Credit is awarded for only one of the following sequences: KOR 001, KOR 002, KOR 003, and KOR 004; KOR 001, KOR 002, and KOR 020B; KOR 020A and KOR 020B.

KOR 005 Second-Year Korean 4 Lecture, 4 hours. Prerequisite(s): KOR 004 or KOR 020B. A continuation of Korean language study. Emphasizes reading, writing, grammar, and conversation. Conducted primarily in Korean.

KOR 020A First-Year Korean For Heritage Learners 4 Lecture, 4 hours. Prerequisite(s): Student must take the Korean placement examination. A first-year Korean course designed for heritage learners who have some proficiency in listening comprehension and speaking but are unable to read and write in Korean. Credit is awarded for only one of the following sequences: KOR 001, KOR 002, KOR 003, and KOR 004; KOR 001, KOR 002, and KOR 020B; KOR 020A and KOR 020B.

KOR 020B First-Year Korean For Heritage Learners 4 Lecture, 4 hours. Prerequisite(s): KOR 002 with a grade of C- or better or KOR 020A with a grade of C- or better; or equivalent or a sufficiently high test score on the Korean placement examination as determined by the department faculty. A first-year Korean course designed for heritage learners who have some proficiency in listening comprehension and speaking but are unable to read and write in Korean. Credit is awarded for only one of the following sequences: KOR 001, KOR 002, KOR 003, and KOR 004; KOR 001, KOR 002, and KOR 020B; KOR 020A and KOR 020B.

KOR 042 Korean Culture and Society 4 Lecture, 3 hours; screening, 15 hours per quarter; extra reading, 1.5 hours. Prerequisite(s): none. An introduction to major themes, events, and trends in Korean culture and society. Covers the end of the nineteenth century to the present. All readings are in English, and all films have subtitles.

KOR 047 Introduction to Korean Film 4 Lecture, 3 hours; screening, 2 hours; discussion, 1 hour. An introduction to the major directors and films of Korea. Covers the genres and periods of works produced from the 1960s to the present. All films have English subtitles. No previous knowledge of Korean language or culture required. Cross-listed with AST 047, and MCS 047.

Upper-Division Courses

KOR 101 Advanced Korean 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): KOR 005 or consent of instructor. Designed to develop students' fluency in Korean to the level of intellectual conversation. Students review Korean web sites, view Korean films, read Korean short stories and journal articles, and discuss current issues of Korean society.

KOR 110 (E-Z) Themes in Modern and Contemporary Culture of Korea 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Explores themes of modern and contemporary Korean literature and culture. M. History, Memory, And Nostalgia; T. Tradition Of Social Criticism.

KOR 112 Modern Korean Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of modern Korean literature from the colonial era to the present. Topics include colonialism; cultural influence and exchange; gender, family and sexuality; nation and nationalism; Confucian tradition and patriarchal culture; and modernization and capitalism. Cross-listed with AST 112.

KOR 120 Narrating the Korean War 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the Korean War from various perspectives and through diverse reading and visual material (including film). Topics and themes may include narrative techniques, colonialism, imperialism, militarism, humanism, nationalism, the East/West relationship, and gender ideologies.

Languages

Committee in Charge

Anne McKnight, Ph.D., Director
Japanese/Comparative Literature
Heidi Waltz, Ph.D. *Linguistics/Germanic Studies*
Yenna Wu, Ph.D. *Chinese/Civilizations/Comparative Literature*
Daryle Williams, Ph.D, Dean, College of Humanities, Arts, and Social Sciences, ex officio

Major

The B.A. in Languages enables a student to specialize in two foreign languages through the acquisition of language competencies, as well as exposure to the theoretical basis and structure of language itself (linguistics), and the study of the cultural and literary practices, which the target languages reflect and enact. Students interested in a single language concentration should see individual language program listings in this catalog.

1. **CPLT 001 or CPLT 001W, LING 020, and 1 lower-division CPLT course**
2. **Elementary and intermediate courses in languages one and two as required**
3. **Forty-Four (44) upper-division units distributed as follows:**
   a) Language one — 20 units which must include the following minimums:
      (1) Twelve (12) units in language
      (2) Eight (8) units in literature and culture
   b) Language two — 12 units which must include the following minimums:
      (1) Eight (8) units in language
      (2) Four (4) units in literature and culture
   c) LING 111 — 4 units
   d) One upper-division course in Linguistics or one additional upper-division course in the first or second language or literature — 4 units
   e) CPLT 193 (4 units). (CPLT 196 strongly recommended but not required.)

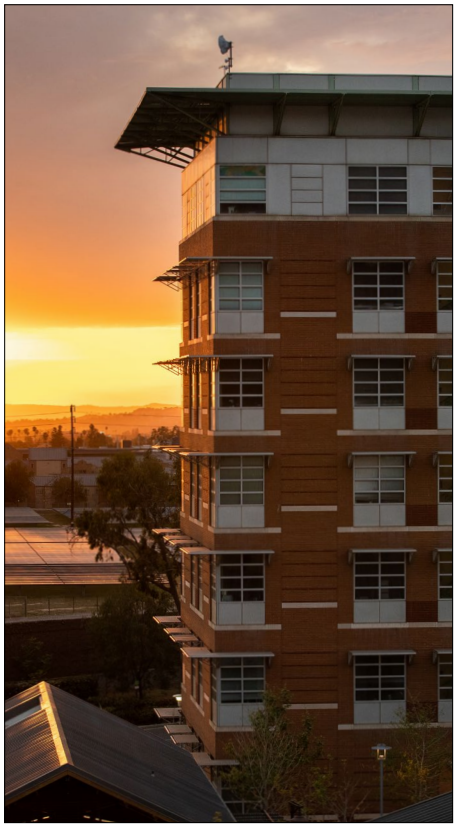
Subject abbreviation: LTLG

Graduate Course

LTLG 250 Colloquium in Literatures and Languages 1 to 2 Seminar, 1 hour. Prerequisite(s): graduate standing. Lectures and discussions by staff, visiting scholars and students on current research topic. Students delivering lectures may take the course for 2 units, students attending lecture and discussions may take the course for 1 unit. May not count towards minimum unit requirement for the degree. Graded Satisfactory (S) or No Credit (NC).

Professional Course

CPLT 301 Teaching of Foreign Language at the College Level 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).



Linguistics

Subject abbreviation: LING
College of Humanities, Arts, and Social Sciences

Committee in Charge

Vrinda Chidambaram, Director (Comp Lit & Lang)
Curt Burgess (Psychology)
Christine Chiarello (Psychology)
Emily Graham (Comp Lit & Lang)
Peter Graham (Philosophy)
Claudia Holguin (Hispanic Studies)
Gerald Maguire (Medical School)
Hyejin Nah (Anthropology)
Michael Nelson (Philosophy)
Covadonga Lamar Prieto (Hispanic Studies)
Wesley Leonard (Ethnic Studies)
Christian Shelton (Computer Science)
Heidi Waltz (Comp Lit & Lang)
Daryle Williams, Ph.D, Dean, College of Humanities, Arts, and Social Sciences, ex officio

Linguistics is the science of language. It seeks to discover the psychological and motor mechanisms of human speech, the similarities and differences among languages, how languages change, and the way in which language is acquired. Because linguistics is largely independent of fields with which the student is likely to be familiar, no special background is required for students entering the major.

Linguistics interacts with a wide variety of fields, such as articulatory phonetics (biology), acoustic phonetics (physics), field methods (anthropology), language and culture (anthropology), sociolinguistics, psycholinguistics, neurolinguistics, logic, the philosophy of language, and the study of particular languages (including their history). This interaction provides opportunities for students with varied interests and can give new perspectives to those in related disciplines.

Major

Upon electing the linguistics major, and certainly no later than the middle of the sophomore year, a student should see the Director of the Linguistics Committee for advising.

The director can help students find a suitable advisor to file the necessary forms. In consultation with an advisor, a student plans a coherent program of specific courses to meet the requirements below. The student and the advisor must then submit a copy of the program to the full Committee on Linguistics for approval.

Students interested in the linguistics major should request from the committee director information concerning the many possible course programs. Many of them permit double majors, thus providing strong preparation for further study in two fields.

Students may add variety and depth to their UCR linguistics major by attending a Summer Program in Linguistics (held in various places) or by participating in Education Abroad. This is an excellent opportunity to become deeply familiar with another country and its culture while earning academic units toward graduation. Students should plan well in advance to ensure that the courses taken outside of the U.S. fit in their overall program at UCR. Consult the departmental student affairs officer for assistance. For details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Requirements for the major are as follows:

1. LING 020
2. Twenty-four (24) upper-division units distributed as follows:
   a) LING 111, LING 121, LING 131, LING 141
   b) ANTH 123
   c) PHIL 132 or PSYC 135
3. At least 12 additional upper-division units of linguistic electives, to be chosen in consultation with the advisor and with the approval of the Linguistics Program director. (The additional courses may be in linguistics or in related fields. They may relate either to a particular field or specialization or to general linguistics.)
4. Foreign language proficiency equivalent to six quarters (24 units) of study, including at least fourth-quarter proficiency in one language. (Students may arrange with the director to satisfy this requirement by examination.)

Honors Program in Linguistics

1. **Linguistics requirement:** LING 020, LING 111, LING 121, LING 141, LING 190, LING 191
2. **Related courses requirement:**
   a) ANTH 120, ANTH 123
   b) ENGL 112
   c) CS 008, CS 10A, CS 10B
   d) MATH 144
   e) PHIL 008 or PHIL 008H
   f) Additional courses as may be required by the Linguistics Committee
3. **Language Requirement — study in at least two language areas:**
   a) Primary language: 24 units of foreign language instruction in a single language (this may include any courses taught in that language) plus courses in the structure, phonetics and history of the primary language, if available
   b) Secondary language: 16 units of a single language or at least 8 units in each of two languages (none of which may be members of the same subfamily of Indo-European as the primary language) plus at least 8 units in the structure, phonetics, or history of the language(s) chosen for the secondary area

In fulfilling the language requirement, students interested in earning a degree beyond the B.A. should take into account the foreign language requirements of the graduate schools to which they may apply. Students must have at least a 3.00 GPA in courses required for the Honors Program.

Lower-Division Courses

LING 020 Language and Linguistics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to modern linguistics. Covers the nature of language; language structure; grammars; the languages of the world; historical and comparative linguistics; and interdisciplinary approaches including anthropological and psycholinguistics.

LING 021 Grammar 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Fundamental concepts of grammatical structure. Includes parts of speech, paradigms, word families, agreement and government, the grammar of sentences and longer units of discourse, and style.

Upper-Division Courses

LING 111 Phonetics 4 Lecture, 3 hours; laboratory, 1 hour; research, 1 hour; extra reading, 1 hour. Prerequisite(s): LING 020; or consent of instructor. Develops practice in pronouncing and recognizing sounds from many languages. Covers methods of transcribing and analyzing these sounds.

LING 121 Syntax 4 Lecture, 3 hours; individual study, 2 hours; research, 2 hours; extra reading, 1 hour. Prerequisite(s): LING 020. Survey of various approaches to syntax including transformational. Examines syntactic structures of English and other languages. Applies to: English, foreign languages, philosophy, and mathematics.

LING 131 Morphology 4 Lecture, 3 hours; research, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): LING 020; LING 111 or LING 121. Studies word structure, the lexical component of language, allomorphy, types of morphemes, and inflexional and derivational morphology. Examines various theories of lexical/morphological organization in the brain. Provides examples from English and other Indo-European languages.

LING 141 Phonology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): LING 111. Introduction to the study of functional sound units in speech, including phonotactics, morphophonemics. Various theories are examined, including generative. Applications: speech correction, speech analysis, English, foreign languages.

LING 151 Semantics 4 Lecture, 3 hours; extra reading, 1 hour; outside research, 1 hour; term paper, 1 hour. Prerequisite(s): LING 121. Introduces the study of meaning and its metalinguistic preliminaries. Explores lexical, sentence, and utterance meaning (including speech acts, text, and discourse). Provides a survey of theories of meaning, such as structural semantics and language as a semiotic system.

LING 160 (E-Z) Topics in Dynamic and Comparative Linguistics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): LING 111; LING 121 or LING 141. Comparative analyses of language groups such as Spanish and Portuguese, Slavic languages, and Native American languages. E. Historical Linguistics;

F. Dialectology; G. Language Change; I. Sociolinguistics.

LING 162 Language and the Brain 4 Lecture, 3 hours; research, 2 hours; extra reading, 2 hours. Prerequisite(s): LING 020 or PSYC 110 or PSYC 135 or CBNS 106; or consent of instructor. Interdisciplinary introduction to the study of language and the brain. Includes brain evolution for language, neural bases for language production and language comprehension, aphasiology and language disorders, and additional special topics. Cross-listed with PSYC 128.

LING 163 Anatomy and Physiology of Speech, Language, and Swallowing 4 Lecture, 3 hours; laboratory, 2 hours; research, 1 hour. Prerequisite(s): LING 111 with a grade of C- or better; or consent of instructor. An in-depth study of the anatomical structures involved in speech, language, and swallowing and their physiological functions. Includes knowledge of the speech subsystems (respiration, phonation, resonance, and articulation), neural features related to language, and the structures involved in deglutition.

LING 165 A Linguist's Guide to Speech Language Pathology 4 Lecture, 3 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): LING 020 with a grade of C- or better, LING 163 with a grade of C- or better; restricted to major(s) Education, Society, Human Dev, Linguistics, Psychology. Introduces the scope of practice of Speech Language Pathology (SLP). Offers broad overviews of the disorders evaluated, diagnosed, and treated by speech-language pathologists.

LING 167 Structural/Descriptive Linguistics 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): LING 020 or consent of instructor. An overview, from the original sources, of the contribution of major figures and schools in linguistics from Saussure through early Chomsky. Cross-listed with ANTH 167.

LING 190 Special Studies 1 to 5 To be taken with the consent of the chair of the Committee as a means of meeting special curricular problems. Course is repeatable.

LING 192 Tutorial Activities 1 to 2 Prerequisite(s): junior or senior standing and nomination by faculty. Enlarging understanding of linguistics through conducting tutorial sessions in introductory courses, under the supervision of faculty members responsible for the courses involved. Graded Satisfactory (S) or No Credit (NC). May be repeated for a maximum of three quarters.

LING 195 Senior Thesis 2 to 4 Thesis, 6 to 12 hours. Prerequisite(s): senior standing or consent of instructor. Independent research and preparation of a thesis completed under the supervision of a faculty member. Course is repeatable to a maximum of 12 units.

LING 195H Senior Honors Thesis 2 to 4 Thesis, 6 to 12 hours. Prerequisite(s): invitation by faculty to pursue honors work in Linguistics; senior standing or consent of instructor. Intensive study, research, and preparation of a thesis in consultation with a faculty member. To be taken during two or three successive quarters; course is repeatable to a maximum of 12 units.

LING 198 R'course: Variable Topics 1 Activity hours vary per R'Course proposal, Prerequisite(s): permission needed from department; sophomore standing or better. An opportunity for UCR undergraduate students to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original course topics are variable and unique from other departmental course offerings, designed to highlight the student facilitators' expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 8 units.

Related Courses

Refer to departmental listings for course descriptions.

Anthropology
- ANTH 120 (Language and Culture)
- ANTH 123 (Linguistic Anthropology)
- ANTH 165 (Cognitive Anthropology)
- ANTH 259 (Anthropological Linguistics)

Education
- EDUC 171 or EDUC 172 (Reading and Language Development)
- EDUC 179A (Language Development in Content Areas)
- EDUC 179B (Language Development in Content Areas)
- EDUC 201A (Theories and Processes of Reading)

English
- ENGL 112 (History of the English Language)

French
- FREN 104 (Phonetics)

Mathematics
- MATH 144 (Introduction to Set Theory)

Philosophy
- PHIL 125 (Intermediate Logic)
- PHIL 126 (Advanced Logic)
- PHIL 132 (Philosophy of Language)

Psychology
- PSYC 110 (The Brain and Behavior)
- PSYC 134 (Cognitive Processes)
- PSYC 135 (Psycholinguistics)
- PSYC 163 (Cognitive Development)

Spanish
- SPN 105 (Phonology of the Spanish Language)
- SPN 106 (Structure of the Spanish Language)
- SPN 107 (Spanish in the United States)
- SPN 207 (History of the Spanish Language)

Russian Studies

Subject abbreviation: RUSN

Committee in Charge

Vrinda Chidambaram, Ph.D., Director, *Linguistics/Comparative Literature*
Ekaterina Yudina, Ph.D. *Russian*
Daryle Williams, Ph.D, Dean, College of Humanities, Arts, and Social Sciences, ex officio

Students are encouraged to participate in Education Abroad. This is an excellent opportunity to become deeply familiar with another country and its culture while earning academic units toward graduation. Students should plan well in advance to ensure that the courses taken outside of the U.S. fit in their overall program at UCR. Consult the departmental student affairs officer for assistance. For details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Major

The Russian Studies B.A. has been developed for students who are interested in Russian language and literature, Russian history and civilization.

Individual major programs are dependent upon the students' particular interests. In consultation with the advisor, each student plans a coherent program of courses to meet the requirements for the major. Normally, students' programs are submitted for approval no later than the beginning of their junior year.

1. **Lower-division requirement: CPLT 001 or CPLT 001W, and 1 lower-division CPLT course**
2. **Upper-division requirements**
   a) Language requirement: 12 units from RUSN 101 (E-Z), RUSN 102 (E-Z), RUSN 120 (E-Z), RUSN 103
   b) Literature requirement: 12 units from RUSN 109A, RUSN 109B, RUSN 109C
3. **8 units from EUR 111A, EUR 111B, EUR 111C**
4. **CPLT 193 (4 units). (CPLT 196 strongly recommended but not required)**

Total upper-division units: 36.

Minor

The department offers a 24-unit disciplinary minor in Russian Studies.

The requirements for the minor are as follows:

1. Eight (8) units of RUSN 101 (E-Z), RUSN 102 (E-Z), RUSN 103
2. Sixteen (16) units of Russian Literature and Civilization courses chosen from the following:

   RUSN 109A, RUSN 109B, RUSN 109C, RUSN 120 (E-Z)

   EUR 111A, EUR 111B, EUR 111C

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Foreign Language Placement Examination
A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

Lower-Division Courses

RUSN 001 Elementary Russian 4 Lecture, 4 hours. Prerequisite(s): none. An introduction to the sound system and grammar of Russian, with attention to the development of the four skills of listening, speaking, reading, and writing.

RUSN 002 Elementary Russian 4 Lecture, 4 hours. Prerequisite(s): RUSN 001 with a grade of "C-" or better. An introduction to the sound system and grammar of Russian. Focuses on the development of the four skills of listening, speaking, reading, and writing.

RUSN 003 Elementary Russian 4 Lecture, 4 hours. Prerequisite(s): RUSN 002 with a grade of "C-" or better. An introduction to the sound system and grammar of Russian. Focuses on the development of the four skills of listening, speaking, reading, and writing.

RUSN 004 Intermediate Russian 4 Lecture, 4 hours. Prerequisite(s): RUSN 003 with a grade of "C-" or better. A comprehensive review of the basic grammatical structures of Russian. Includes irregular and idiomatic forms, vocabulary building, and development of conversation and composition skills.

RUSN 027 Russian Conversation 1 Discussion, 1 hour. Prerequisite(s): RUSN 001. Weekly discussion of topics of current interest, intended to develop and maintain basic conversational skills. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit for a total of 6 units.

RUSN 045 Soviet Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A survey of the Soviet cinema beginning with the film innovations of the 1920s and continuing with representative films from each of the ensuing periods of Soviet culture. All work done in English.

RUSN 090 Special Studies 1 to 5 To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable.

Upper-Division Courses

RUSN 101 (E-Z) Advanced Russian 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): RUSN 004. Students read texts in literature and expository prose, with attention to usage, style, grammar, and interpretation. Emphasis on developing reading and translating skills for adult-level reading competence. G. Readings From Poetry; J. Readings From Soviet Literature; M. Readings From Drama; N. Readings In History; O. Readings In Social Science; Q. Readings In Newspapers And Popular Literature; R. Readings From Classics Of Russian Literature.

RUSN 102 (E-Z) Advanced Russian: Grammer 2 Lecture, 2 hours. Prerequisite(s): RUSN 004. Each segment will deal with a specific topic in Russian grammar at an advanced level. Texts or materials vary from quarter to quarter. E. Nominal Declensions; F. Syntax I; G. Phonetics; I. Syntax II; J. Syntax III; K. Vocabulary Building; M. Verb Morphology.

RUSN 103 Advanced Russian Conversation and Composition 2 Lecture, 2 hours. Prerequisite(s): RUSN 004 or consent of instructor. Conversation and short compositions in Russian. Intended to develop and maintain basic conversational and writing skills. Course is repeatable to a maximum of 8 units.

RUSN 109A Survey of Russian Literature in Translation 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to major literary figures and representative masterpieces of the Golden Age (1830-1880). Any course in the RUSN 109A, RUSN 109B, and RUSN 109C sequence may be taken independently.

RUSN 109B Survey of Russian Literature in Translation 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to major literary figures and representative classics of the late nineteenth century and prerevolutionary twentieth century (1880-1917). Any course in the RUSN 109A, RUSN 109B, and RUSN 109C sequence may be taken independently.

RUSN 109C Survey of Russian Literature in Translation 4 Lecture, 3, hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to major literary figures and representative works of the Soviet period (1917-1991). Any course in the RUSN 109A, RUSN 109B, and RUSN 109C sequence may be taken independently.

RUSN 120 (E-Z) Studies in Russian Literature 4 Lecture, 3 hours; extra reading, 3 hours. Analysis and discussion of representative works of Russian literature. Readings are in Russian and vary from quarter to quarter. F. Readings In Twentieth Century; G. Readings In Nineteenth Century.

RUSN 190 Special Studies 1 to 5 To be taken with the consent of the chairman of the department as a means of meeting special curricular problems. Course is repeatable.

RUSN 195 Senior Thesis 1 to 4 Research, 3 to 12 hours. Prerequisite(s): senior standing and consent of instructor. The student works independently with a faculty member doing research and preparing a thesis as a final phase of the student's major.

Graduate Courses

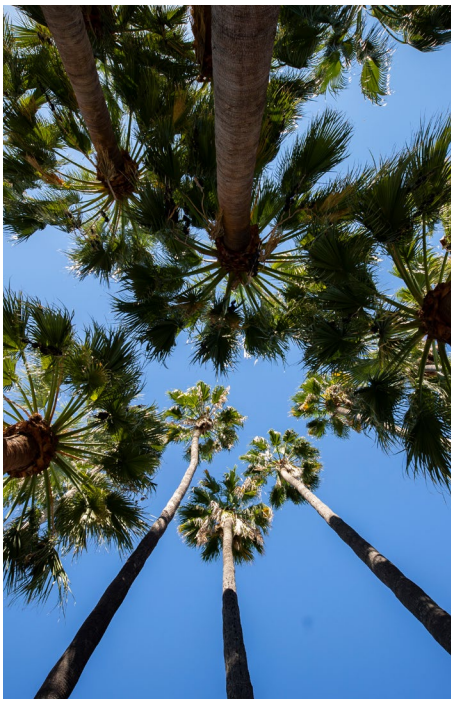
CPLT 290 Directed Studies 1 to 6 Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

RUSN 292 Concurrent Analytical Studies 2 Research, 6 hours. Prerequisite(s): graduate standing; and consent of instructor; concurrent enrollment in RUSN 100-series course. To be taken on an individual basis. Student will complete a graduate paper based on research related to the RUSN 100-series course. May be repeated with different topic. RUSN 103 may not be used for RUSN 292.

Professional Courses

CPLT 301 Teaching of Foreign Language at the College Level 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing, or senior standing with consent of instructor. Covers first and second language acquisition; general models of L2 learning; learning different types of grammar; learning other components of language: acquisition of pronunciation, vocabulary, and discourse; multilingual societies and the goals of language teaching; and implications of second language acquisition research for the foreign language classroom. Graded Satisfactory (S) or No Credit (NC).

RUSN 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in Supervised teaching in lower-division courses. Required of all teaching assistants in Russian. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.



Southeast Asian Minor

The Southeast Asian minor provides students with the opportunity to enhance their knowledge of Southeast Asian languages, cultures, and literatures.

1. **Lower-division requirements (8 units plus language proficiency)**
   a) Proficiency in one of the Southeast Asian languages (Vietnamese/Indonesian/Tagalog) through the first-year level
   b) Eight (8) units from lower-division lecture courses on Southeast Asian literature and culture: AST 062/CPLT 062/SEAS 062, AST 063/CPLT 063/SEAS 063, AST 064/MCS 049/SEAS 064/VNM 064, AST 065/SEAS 065
2. **Upper-division requirements**
   Sixteen (16) units in Southeast Asian literature and culture from CPLT 142V/WMST 142V, AST 161/SEAS 161, AST 162/HIST 187/VNM 162, AST 163/CPLT 163/SEAS 163, AST 165 (E-Z)/SEAS 165 (E-Z)/VNM 165 (E-Z)/WMST 165(E-Z), AST 166/CPLT 166/SEAS 166/VNM 166, AST 167/CPLT 167/SEAS 167, AST 168/MUS 168/SEAS 168, or graduate courses in Southeast Asian literature and culture (with consent of instructor) such as CPLT 200/SEAS 200 and CPLT 205/SEAS 205

Vietnamese Courses

Foreign Language Placement Examination A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course may not take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

Lower-Division Courses

VNM 001 Elementary Vietnamese 4 Lecture. 4 hours. Prerequisite(s): student must take the Vietnamese placement examination. An introduction to the sound system and grammar of Vietnamese. Focuses on the development of the four skills: comprehension, speaking, reading, and writing. Classes are conducted in Vietnamese as often as possible. Credit is awarded for only one of the following sequences: VNM 001, VNM 002, and VNM 003; VNM 020A and VNM 020B.

VNM 002 Elementary Vietnamese 4 Lecture, 4 hours. Prerequisite(s): VNM 001 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Vietnamese placement examination as determined by the department faculty An introduction to the sound system and grammar of Vietnamese. Focuses on the development of the four skills: comprehension, speaking, reading, and writing. Classes are conducted in Vietnamese as often as possible. Credit is awarded for only one of the following sequences: VNM 001, VNM 002, and VNM 003; VNM 020A and VNM 020B.

VNM 003 Elementary Vietnamese 4 Lecture, 4 hours. Prerequisite(s): VNM 002 with a grade of "C-" or better or equivalent or a sufficiently high test score on the Vietnamese placement examination as determined by the department faculty An introduction to the sound system and grammar of Vietnamese. Focuses on the development of the four skills: comprehension, speaking, reading, and writing. Classes are conducted in Vietnamese as often as possible. Credit is awarded for only one of the following sequences: VNM 001, VNM 002, and VNM 003; VNM 020A and VNM 020B.

VNM 004 Intermediate Vietnamese 4 Lecture, 4 hours, Prerequisite(s): VNM 003 with a grade of "C-" or better or VNM 020B with a grade of "C-" or better or equivalent or a sufficiently high test score on the Vietnamese placement examination as determined by the department faculty. Emphasizes further development of vocabulary, reading, writing, comprehension, and speaking skills. Provides foundation for recognizing, formulating, and articulating complex ideas.

VNM 005 Intermediate Vietnamese 4 Lecture, 4 hours, Prerequisite(s): VNM 004 or equivalent or a sufficiently high test score on the Vietnamese placement examination as determined by the department faculty Emphasizes further development of vocabulary, reading, writing, comprehension, and speaking skills. Provides foundation for recognizing, formulating, and articulating complex ideas.

VNM 020A Beginning Vietnamese For Advanced Heritage Learners 4 Lecture, 4 hours. Prerequisite(s): Student must take the Vietnamese placement examination Structured for the heritage student at the beginning level who has advanced comprehension and some speaking skills. Focuses on developing language skills and improving existing reading and writing skills. Credit is awarded for only one of the following sequences: VNM 001, VNM 002, and VNM 003; VNM 020A and VNM 020B.

VNM 020B Beginning Vietnamese For Advanced Heritage Learners 4 Lecture, 4 hours. Prerequisite(s): VNM 020A with a grade of "C-" or better or equivalent or a sufficiently high test score on the Vietnamese placement examination as determined by the department faculty. Builds upon course work covered in VNM 020A. Includes integrating situational lessons with vocabulary, sentence patterns, grammar, and socio-linguistics used in daily life. Credit is awarded for only one of the following sequences: VNM 001, VNM 002, and VNM 003; VNM 020A and VNM 020B.

VNM 064 Introduction to Vietnamese and Diasporic Film Culture 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Engages in critical viewing strategies and analytical visual critique. Explores the revival of film production in Vietnam following the Vietnam War, with a focus on the means of production, state control, and international distribution. Readings are in translation; classes conducted in English. Cross-listed with AST 064, MCS 049, and SEAS 064.

Upper-Division Courses

VNM 101 Advanced Vietnamese 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): VNM 005 or equivalent or a sufficiently high test score on the Vietnamese placement examination as determined by the department faculty or consent of instructor. Designed to develop fluency in Vietnamese to the level of intellectual conversation. Emphasis is on reading and writing of Vietnamese literature and criticism, visual culture, and discussion of current issues of Vietnamese society.

VNM 162 Vietnamese Literary History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. A historical analysis of Vietnamese literature from its oral tradition to contemporary fiction. Follows the formation of the nation-state and the subsequent struggles with the Chinese, French, Japanese, and Americans. No knowledge of Vietnamese required. Readings are in translation or bilingual editions. Classes are conducted in English. Cross-listed with AST 162, HIST 187, and SEAS 162.

VNM 164 Vietnamese American Culture 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the pervasive aspects of Vietnamese American culture. Includes shared histories, acculturation patterns, class diversity, identity struggles, community-building literary and cultural production, youth issues, and cultural survival. Also introduces foundational literature, visual culture, and scholarship in the field. Cross-listed with AST 164, and SEAS 164.

VNM 165 (E-Z) Themes in Vietnamese Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. An exploration of Vietnamese literature in translation as seen through the lens of a particular theme or issue. Focuses on the implications of gender and sexuality on nation formation. All materials are read or viewed in English. E. Women And War. Cross-listed with AST 165 (E-Z), GSST 165 (E-Z), and SEAS 165 (E-Z).

VNM 166 Vietnam and the Philippines 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the comparative national histories of Vietnam and the Philippines by way of great literary works in various genres including poetry, short fiction, and novels. All materials are read in English. Cross-listed with CPLT 166, AST 166, and SEAS 166.

VNM 184 The Vietnam Wars 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to Vietnamese history in the

twentieth century. Covers the three Indochina wars (1945-1986) from different Vietnamese perspectives. Topics include experiences during French colonial rule; the anticolonial movements; periods of French and American military involvement up to 1975; the postwar society; and the post-doi moi society. Cross-listed with AST 160, HIST 184, and SEAS 184.

Computer Engineering

Subject abbreviation: CEN
The Marlan and Rosemary Bourns College of Engineering

CEN Undergraduate Faculty
Hyoseung Kim, Ph.D., Chair
Daniel Wong, Ph.D., Vice Chair
Advising Office, 310 Skye Hall

(951) 827-ENGR (3647);
student.engr.ucr.edu

Program Committee

Nael Abu-Ghazaleh, Ph.D. (Computer Science and Engineering/Electrical and Computer Engineering)
Philip Brisk, Ph.D. (Computer Science and Engineering)
Zizhong Chen, Ph.D. (Computer Science and Engineering)
Roman Chomko, Ph.D. (Computer Science and Engineering)
Rajiv Gupta, Ph.D. (Computer Science and Engineering)
Hyoseung Kim, Ph.D. (Electrical and Computer Engineering)
Allan Knight, Ph.D. (Computer Science and Engineering)
Cong Liu, Ph.D. (Electrical and Computer Engineering)
Walid Najjar, Ph.D. (Computer Science and Engineering)
Hang Qiu, Ph.D. (Electrical and Computer Engineering)
Shaolei Ren, Ph.D. (Electrical and Computer Engineering)
Elaheh Sadredini, Ph.D. (Computer Science and Engineering)
Sheldon Tan, Ph.D. (Electrical and Computer Engineering)
Zhaowei Tan, Ph.D. (Computer Science and Engineering)
Hung-Wei Tseng, Ph.D. (Electrical and Computer Engineering)
Albert Wang, Ph.D. (Electrical and Computer Engineering)
Neftali Watkinson, Ph.D. (Computer Science and Engineering)
Daniel Wong, Ph.D. (Electrical and Computer Engineering)
Qian Zhang, Ph.D. (Computer Science and Engineering)

Major

The Computer Engineering major stresses the study of core computer science and electrical engineering topics. It prepares students for careers in the design of complex systems involving computer hardware, computer software, electronics and electrical signals for communications, networking, desktop computing, and embedded computing.

The objective of the Computer Engineering program is to produce graduates who:

- have a mastery of the fundamental areas required for designing and using computers and engineered systems that contain computers
- have an ability to apply principles of engineering, mathematics, science, and statistics to the use, design, and interfacing of computers
- are able to apply modern design methodologies and state-of-the-art tools to design problems common to modern computer engineering practice
- have had extensive, relevant laboratory and hands-on experience to strengthen their understanding of scientific, logical, statistical, and engineering principles
- have a well-rounded and balanced education through required studies in elected areas of the humanities and social sciences
- are adept at both oral and written communication
- possess the high-quality undergraduate education necessary to progress to the M.S. and Ph.D. level or succeed in a career in industry
- understand the social, cultural, ethical, and environmental context of their work

The Bachelor of Science in Computer Engineering Program is accredited by the Engineering Accreditation Commission of ABET, abet.org, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s) and Similarly Named Engineering Programs. For additional details, visit cen.ucr.edu/.

The Intersegmental General Education Transfer Curriculum (IGETC) does not meet transfer requirements for Engineering.

All undergraduates in the College of Engineering must see an advisor at least annually. Visit student.engr.ucr.edu for details.

Change of Major Criteria

All students who request a change of major to Computer Engineering must meet the following requirements:

- Be in good academic standing
- Have no less than a C- in any Math, Science and Engineering coursework
- Be able to complete major within maximum allowable units
- Complete all the courses listed below, based on the total number of units earned, prior to submitting the major change request
- UCR transfer students interested in changing to a BCOE major must have been admissible to the major at point of entry, or must satisfy transfer admission and change of major requirements before earning 120 units
- If changing in the 90-119 units category student must have the ability to complete major within 5 years of entry as aFreshmen or 3 years after entry as a Transfer student
- Students who have earned 120 or more units are not eligible for a change of major in BCOE. NOTE: AP/IB units are excluded from maximum unit calculation

Completed 0 to less than 45 units
Completion of ENGL 001A with C or better, and a C or better in CS 010A, and completion of the following with at least 2.700 GPA:

- CS 010A
- MATH 009A
- PHYS 040A
- Any additional Math/Science/Engineering/CS courses

Completed 45 to less than 90 units
Completion of ENGL 001A with C or better, and a C or better in CS 010A and CS 010B, and completion of the following with at least 2.700 GPA:

- CS 010A
- CS 010B
- CS 061
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A or PHYS 040HA
- Any additional Math/Science/Engineering/CS courses:

Completed 90 to less than 120 units
Completion of ENGL 001A and ENGL 001B with C or better, and a C or better in CS 010A and CS 010B, and completion of the following with at least 2.700 GPA:

- CS 010A
- CS 010B
- CS 061
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A or PHYS 040HA
- PHYS 040B or PHYS 040HB
- Any additional Math/Science/Engineering/CS courses

University Requirements

See Undergraduate Studies section.

College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Computer Engineering major uses the following major requirements toward the satisfaction of some of the college's Natural Science and Mathematics breadth requirements.

1. MATH 009A
2. PHYS 040A, PHYS 040B, PHYS 040C

Major Requirements

1. **Lower-division requirements (72 units):**
   a) ENGR 001G
   b) CS 010A, CS 010B, CS 010C, CS 061
   c) CS 011/MATH 011
   d) EE 020A/MATH 045, EE 020B, EE 030A, EE 30LA, EE 030B
   e) MATH 009A, MATH 009B, MATH 009C, MATH 010A
   f) PHYS 040A, PHYS 040B, PHYS 040C
   g) CHEM 001A or ME 010
2. **Upper-division requirements (77 units minimum)**
   a) ENGR 101G
   b) CS 100, CS 141, CS 153, CS 161, CS 161L
   c) CS 120A/ EE 120A, CS 120B/EE 120B; one course from CS 122A or EE 128
   d) CS 111
   e) CS 168/EE 168
   f) ENGR 180W
   g) EE 100A
   h) EE 111
   i) EE 114
   j) Six courses (at least 24 units) as technical electives from the following set of upper division courses:

   CS 110, CS 122A, CS 122B, CS 130, CS 142, CS 144, CS 150, CS 152, CS 160, CS 162, CS 164, CS 165, CS 166, CS 169, CS 170, CS 171, CS 172, CS 175, CS 177, CS 178A, CS 178B, CS 179 (E-Z), CS 180, CS 181, CS 182, CS 183, CS 193 EE, 100B, EE 105, EE 106, EE 115, EE 123, EE 128 EE 132, EE 133, EE 135, EE 136, EE 137, EE 141, EE 144, EE 146, EE 147, EE 150, EE 151, EE 152, EE 162, EE 165, EE 175A, EE 175B, ENGR 160

The technical electives selected from j) must include a senior capstone project option selected from the following 3 options: (1) CS 179 (E-Z), (2) CS 178A and CS 178B (both need to be taken), or (3) EE 175A and EE 175B (both need to be taken). The technical electives must be distinct from those used to satisfy the upper-division requirements specified in items a) to i) above.

Students may petition for exceptions to the above degree requirements. Exceptions to Computer Science and Electrical Engineering course requirements must be approved by the Computer Engineering undergraduate faculty advisor or chair.

Visit the Student Affairs Office in the College of Engineering or **student.engr.ucr.edu** for a sample program.

Graduate Program

The Computer Engineering program offers the B.S. + M.S. program and the M.S. degree in Computer Engineering. Specific requirements or each degree are described below.

Master's Degree

M.S. in Computer Engineering

The college offers an M.S. program in Computer Engineering.

Admission

All applicants to this program must have completed a bachelor's degree or its approved equivalent from an accredited institution and to have attained undergraduate record that satisfies the standards established by the Graduate Division and University Graduate Council. Applicants should have at least an undergraduate major in Computer Engineering, Computer Science, Electrical Engineering or a closely related field. Applicants who fail to meet this criterion may sometimes be admitted with course deficiencies. However, no more than three deficiencies will be allowed.

The Graduate Record Exam (GRE) test is recommended but not required. The GRE subject test in Computer Science or Electrical Engineering is recommended but not required. Applicants whose first language is not English are required to submit acceptable scores from the TEST of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) unless they have a degree from an institution where English is the exclusive language of instruction. Additionally each applicant must submit three letters of recommendation, at least two of which must be academic references. All other application requirements are specified in the graduate application.

Prerequisite Material

Competence in the areas defined by the following UCR courses is essential to graduate study in computer engineering:

EE 100A, CS 153, CS 161, CS 120A/EE 120A

A student who is deficient in any of these competency areas may be asked to pass the corresponding UCR course with a letter grade of at least B, a grade of S if S/NC is an option for the class with the instructors approval, or to pass a challenge examination based on that course's final exam with a grade of at least B. All such remedial work should be completed within the first year of graduate study, and in all cases the deficiency must be corrected BEFORE a student can enroll in any graduate course from the same specialty area. The admission prerequisite courses listed above may not be taken for graduate credit.

Course Requirements

Students must be in residence at least one year and complete a minimum of 48 quarters units of graduate and upper division undergraduate courses in or related to the major subject area. Students can enroll in maximum 15 units per quarter. Exceptions to this quarterly enrollment policy are only made for specific circumstances and are subject to evaluation and approval. Students who have completed similar courses elsewhere may petition for waiver of a required course or for substitution of an alternative course. For students interested in interdisciplinary research, individual study programs can be approved.

1. **Core Requirement (12 units).** Three courses from the list of core courses below, with no grade lower than B-.

   CS 201, CS 202, CS 203, CS 220, EE 213, CS 217/EE 217, CS 251/EE 255
2. **Technical Electives (16 units)**. Choose four from Computer Science or Electrical Engineering 200-level courses. Seminar courses (CS260, EE260), as well as CS 290, CS 297, CS 299 and EE 290, EE 297 and EE 299 may not be used.
3. **Additional Credits (20 units)**. This category may be satisfied by a combination of the choices below:
   - Additional graduate technical electives as described under (2.) above;
   - Up to three of the undergraduate courses below to satisfy additional credits;

     CS 105, CS 111, CS 120B, CS 122A, CS 122B, CS 130, CS/EE 131, CS 141, CS 150, CS 152, CS160, CS 161L, CS 162, CS 164, CS 165, CS 166, CS 168, CS 169, CS 170, CS 171, CS 172, CS 177, CS 179 (E-Z), CS 180, CS 181, CS 183, CS 193, EE 100B, EE 105, EE 115, EE 120B, EE 123, EE 128, EE 132, EE 133, EE 135, EE 141, EE 144, EE 146, EE 150, EE 151, EE 152, EE 165, EE 175A, EE 175B, ENGR 160; or
   - Up to two seminar classes (CS260, EE260);
   - With the pre-approval of the graduate advisor, any relevant 200-level courses from other departments in Engineering or outside. If pre-approval is not obtained, there is no guarantee that a class will be deemed relevant.
4. **Professional Development Requirement, Colloquium (1 unit)**.

   M.S. students must satisfactorily complete one of the following courses: one quarter of CS 287, EE259, GDIV 403, GDIV 403 or at least one unit of CS 298I or EE 298I. Other professional development courses may be used to satisfy this requirement if approved by the graduate advisor.
5. **Capstone Experience**

   All students must complete a capstone experience that synthesizes and integrates the knowledge and skills obtained throughout the master's program, by either passing a comprehensive exam, writing a thesis, or completing a project. The Comprehensive Examination is the default option. If a student chooses the alternative project or thesis option, it is their responsibility to find a faculty member willing to supervise the master's project or thesis, to form the faculty examining committee, and to schedule the oral examination.

   a. **Comprehensive Examination Option**. In addition to the course requirements above, students must pass a comprehensive examination administered by the Computer Engineering Program.

b. **Project Option**. Students may replace up to 4 units of courses listed under "Additional Credits" with 4 units of directed research (CS 297, EE 297) and/or directed studies (CS 290, EE 290). Units obtained in graduate research for the thesis or dissertation (CS 299, EE 299) may not be used to satisfy any course requirements under this option. Students must complete a research project under the guidance of a faculty member. The project will be approved by a committee of at least two faculty members, at least one of whom is a faculty member in the Computer Engineering program, and requires a presentation and written report.

c. **Thesis Option**. Students may replace up to 8 units of courses listed under "Additional Credits" with 8 units of graduate research for the thesis or dissertation (CS 299, EE 299). Units obtained in directed research or directed studies (CS 290, CS 297, EE 290, EE 297) may not be used to satisfy any course requirements under this option. Students must submit a master's thesis in accordance with the general requirements of the university. The thesis is original research work, and it should demonstrate the student's ability to study a research area, identify an open problem and make a research contribution. The thesis requires a presentation and must be approved by a committee of at least three faculty members.

   The final thesis defense presentation can be taken in one of the following modes: In- Person, Hybrid or Remote. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. Students taking the exam In-Person are expected to present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the exam on campus in a video enabled room that supports some members physically present and others remote. The chair of the committee must be physically present for a Hybrid exam.

Combined B.S. + M.S. Five-Year Program. The college offers a combined five-year B.S. + M.S. program, designed to allow successful UCR Computer Engineering B.S. graduates to complete the Master of Science degree in Computer Engineering in one year, by allowing up to 12 credits of coursework taken as a UCR undergraduate to be counted towards the elective requirements of the M.S. (The courses that can be double counted are those that are used as technical electives in the B.S. requirements.) A student may apply at the start of their senior year by submitting an application to the Computer Engineering M.S. program, provided that at the end of junior year, the student was a UCR Computer Engineering B.S. student with cumulative GPA at least 3.4 and had completed the following courses with no grade less than a B- and average grade at least 3.2: CS 100, CS 061 or CS 120A, CS 111 or CS 141, CS 153. The application to the M.S. program must include at least two recommendation letters from UCR Academic Senate faculty members (at least one, and preferably both, CSE faculty). Submission of GRE scores with the application is recommended but not required. Matriculation into the combined program occurs in the Fall term following senior year, provided: (a) the M.S. application is accepted, (b) throughout senior year, the student is a Computer Engineering B.S. major with cumulative GPA 3.4 or higher, (c) by the end of senior year, the student completes the Computer Engineering B.S. degree requirements.

Incoming students who are applying to the Computer Engineering B.S. program may simultaneously apply for preliminary admission into the combined program provided their high school GPA is at least 3.6, their SAT-I combined score is at least 1950, they satisfy the Entry Level Writing requirement before matriculation, and they have sufficient math preparation to enroll in calculus upon arrival. Preliminary admission status is maintained as long as the student is a Computer Engineering or Computer Science B.S. student in good standing with a cumulative GPA of at least 3.4. Preliminarily admitted students still need to apply for full admission in their senior year as described above.

Five-year programs leading to M.S. degrees in other programs (including Computer Science) are also available. They are described separately in the catalog sections for those programs.

Computer Science and Engineering

Subject abbreviation: CS
The Marlan and Rosemary Bourns College of Engineering

Christian Shelton, Ph.D., Chair
Srikanth Krishnamurthy, Ph.D., Vice Chair of Academic Personnel
Zhiyun Qian, Ph.D., Vice Chair of Graduate Education
Stefano Lonardi, Ph.D., Vice Chair of Under graduate Education
CSE Department Office,
351 Winston Chung Hall
(951) 827-5639; cs.ucr.edu

Distinguished Professor

Rajiv Gupta, Ph.D.
Tao Jiang, Ph.D.
Eamonn Keogh, Ph.D.
Vassilis Tsotras, Ph.D.
Kadangode K. Ramakrishnan, Ph.D.

Professors

Nael Abu-Ghazaleh, Ph.D.
Philip Brisk, Ph.D.
Zizhong Chen, Ph.D.
Evangelos Christidis, Ph.D.
Marek Chrobak, Ph.D.
Emiliano De Cristofaro, Ph.D.
Michalis Faloutsos, Ph.D.
Trent Jaeger, Ph.D.
Srikanth Krishnamurthy, Ph.D.
Stefano Lonardi, Ph.D.
Christian Shelton, Ph.D.
Manu Sridharan, Ph.D.
Evangelos Papalexakis, Ph.D.
Zhiyun Qian, Ph.D.
Heng Yin, Ph.D.

Professors Emeriti

Laxmi N. Bhuyan, Ph.D.
Mart L. Molle, Ph.D.
Thomas H. Payne, Ph.D.
Michael Pazzani, Ph.D.
Teodor C. Przymusinski, Ph.D.
Walid Najjar, Ph.D.
Chinya Ravishankar, Ph.D.
Frank N. Vahid, Ph.D.
Neal Young, Ph.D.

Associate Professors

Ahmed Eldawy, Ph.D.
Amr Magdy, Ph.D.
Loannis Karamouzas, Ph.D.
Paea LePendu, Ph.D.
Yan Gu, Ph.D.
Mohsen Lesani, Ph.D.
Mariam Salloum, Ph.D.
Tamar Shinar, Ph.D.
Silas Richelson, Ph.D.
Yihan Sun, Ph.D.
Chengyu Song, Ph.D.
Greg Ver Steeg, Ph.D.
Craig Schroeder, Ph.D.
Zhijia Zhao, Ph.D.

Assistant Professors

Amey Bhangale, Ph.D.
Yue Dong, Ph.D.
Allan Knight, Ph.D.
Neftali W. Medina, Ph.D.
Elaheh Sadredini, Ph.D.
Zhaowei Tan, Ph.D.
Mingxun Wang, Ph.D.
Zhouxing Shi, Ph.D.
Jay Lim, Ph.D.
Bingyao Li, Ph.D.
Qian Zhang, Ph.D.

**

Adjunct Professors

Mohsen Lesani, Ph.D.
Victor B. Zordan, Ph.D.

Cooperating Faculty

Salman Asif, Ph.D. (Electrical and Computer Engineering)
Thomas Girke, Ph.D. (Botany and Plant Sciences)
Basak Guler, Ph.D. (Electrical and Computer Engineering)
Chaturvedi Sonali, Ph.D. (Microbiology & Plant Pathology)
Konstantinos Karydis, Ph.D. (Electrical and Computer Engineering)
Hyoseung Kim, Ph.D. (Electrical and Computer Engineering)
Jiachen Li, Ph.D. (Electrical and Computer Engineering)
Wei Vivian Li, Ph.D. (Statistics)
Cong Liu, Ph.D. (Electrical and Computer Engineering)
Wenxiu Ma, Ph.D. (Statistics)
Hang Qiu, Ph.D. (Electrical and Computer Engineering)
Shaolei Ren, Ph.D. (Electrical and Computer Engineering)
Amit Roy-Chowdhury, Ph.D. (Electrical and Computer Engineering)
Vishwanath Saragadam, Ph.D. (Electrical and Computer Engineering)

Sheldon Tan, Ph.D. (Electrical and Computer Engineering)
Hung-Wei Tseng, Ph.D. (Electrical and Computer Engineering)
Daniel Wong, Ph.D. (Electrical and Computer Engineering)
Nanpeng Yu, Ph.D. (Electrical and Computer Engineering)
Shuheng Zhou, Ph.D. (Statistics)
Yinglun Zhu, Ph.D. (Electrical and Computer Engineering)

Major

The Department of Computer Science and Engineering offers three majors at the undergraduate level. UCR's offerings of all three majors are unique compared to many schools in the emphasis on theoretical foundations and practical applications.

The **Computer Science** major stresses the study of core and advanced computer science topics. It prepares students for a large variety of careers in computing, including software engineering, networks, databases, graphics, algorithms, security, system analysis, and embedded systems.

The objective of the B.S. degree program in Computer Science is to prepare graduates for professional practice in both the private and public sectors and for life-long learning, including the option for graduate degrees, by providing them with:

- Background: the necessary technical competencies, including knowledge of scientific principles and skill at rigorous analysis and creative design
- Breadth: a broad education that includes knowledge of current issues and trends in society and technology
- Professionalism: professional attitudes and ethics and skills for clear communication and responsible teamwork
- Learning environment: a learning environment that is rigorous, challenging, open, and supportive

The **Computer Engineering** major stresses the study of core computer science and electrical engineering topics. It prepares students for careers in the design of complex systems involving computer hardware, computer software, electronics and electrical signals for communication, networking, desktop computing, and embedded computing. See Computer Engineering in this catalog.

The **Computer Science with Business Applications** major covers the core of computer science and basic business and management topics. It prepares students for careers in design and management of computer and information systems, system and network administration, and e-commerce. It is also useful for careers that apply information technology to support business processes.

The objective of the B.S. degree program in Computer Science and Business Applications is to prepare graduates for professional practice in both the private and public sectors and for life-long learning, including the option for graduate degrees, by providing them with:

- Background: the necessary technical competencies, including knowledge of scientific principles and skill at rigorous analysis and creative design
- Breadth: a broad education that includes knowledge of current issues and trends in society and technology
- Professionalism: professional attitudes and ethics and skills for clear communication and responsible teamwork
- Learning environment: a learning environment that is rigorous, challenging, open, and supportive

All undergraduates in the College of Engineering must see an advisor at least annually. Visit **student.engr.ucr.edu** for details.

The two degree programs at UCR, Computer Science B.S. and Computer Science with Business Applications B.S., are accredited by the Computing Accreditation Commission (CAC) of ABET, **abet.org**.

Change of Major Criteria

All students who request a change of major to Computer Science must meet the following requirements:

- Be in good academic standing
- Have no less than a C- in any Math Science and Engineering coursework
- Be able to complete major within maximum allowable units
- Complete all the courses listed below, based on the total number of units earned, prior to submitting the major change request
- UCR transfer students interested in changing to a BCOE major must have been admissible to the major at point of entry, or must satisfy transfer admission and change of major requirements before earning 120 units
- If changing in the 90-119 units category student must have the ability to complete major within 5 years of entry as a Freshmen or 3 years after entry as a Transfer student
- Students who have earned 120 or more units are not eligible for a change of major in BCOE. NOTE: AP/IB units are excluded from maximum unit calculation

Completed 0 to less than 45 units
Completion of ENGL 001A with C or better, and a C or better in CS 010A and CS 010B, and completion of the following with at least 3.00 GPA:

- CS 010A
- CS 010B
- MATH 009A or MATH 09HA
- And any additional Math/Science/Engineering/CS courses (if taken)

Completed 45 to less than 90 units
Completion of ENGL 001A with C or better, and a C or better in CS 010A and in CS 010B, and completion of the following with at least 3.00 GPA:

- CS 010A
- CS 010B
- MATH 011/CS 011
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- And any additional Math/Science/Engineering/CS courses (if taken)

Completed 90 to less than 120 units
Completion of ENGL 001A and ENGL 001B with C or better, and a C or better in CS 010A and in CS 010B, and completion of the following with at least 3.00 GPA:

- CS 010A
- CS 010B
- CS 010C
- CS 061
- MATH 011/CS 011
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- And any additional Math/Science/Engineering/CS courses (if taken)

Change of Major Criteria

All students who request a change of major to Computer Science with Business Applications must meet the following requirements:

- Be in good academic standing
- Have no less than a C- in any Math, Science and Engineering coursework
- Be able to complete major within maximum allowable units
- Complete all the courses listed below, based on the total number of units earned, prior to submitting the major change request
- UCR transfer students interested in changing to a BCOE major must have been admissible to the major at point of entry, or must satisfy transfer admission and change of major requirements before earning 120 units
- If changing in the 90-119 units category student must have the ability to complete major within 5 years of entry as a Freshmen or 3 years after entry as a Transfer student
- Students who have earned 120 or more units are not eligible for a change of major in BCOE. NOTE: AP/IB units are excluded from maximum unit calculation

Completed 0 to less than 45 units
Completion of ENGL 001A with C or better, and a C or better in CS 010A, and completion of the following with at least 2.700 GPA:

- BUS 020
- CS 010A
- MATH 009A or MATH 09HA
- Any additional Math/Science/Engineering/CS courses (if taken)

Completed 45 to less than 90 units
Completion of ENGL 001A with C or better, and a C or better in CS 010A and in CS 010B, and completion of the following with at least 2.700 GPA:

- BUS 020
- CS 010A
- CS 010B
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC

- And any additional Math/Science/Engineering/CS courses (if taken)

Completed 90 to less than 120 units
Completion of ENGL 001A and ENGL 001B with C or better, and a C or better in CS 010A and in CS 010B, and completion of the following with at least 2.700 GPA:

- BUS 020
- CS 010A
- CS 010B
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- MATH 011/CS 011
- And any additional Math/Science/Engineering/CS courses (if taken)

University Requirements

See Undergraduate Studies section.

College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The **Computer Science** major uses the following major requirements toward the satisfaction of some of the college's Natural Sciences and Mathematics breadth requirements and one of the college's English Composition breadth requirements.

1. ENGR 180W
2. MATH 008B or MATH 009A
3. PHYS 040A, PHYS 040B, PHYS 040C

The **Computer Science with Business Applications** major uses the following major requirements toward the satisfaction of the college's Social Sciences breadth requirements and one of the College's Natural Science and Mathematics breadth requirements.

1. ECON 002, ECON 003
2. MATH 008B or MATH 009A
3. SOC 150

Major Requirements

Computer Science Major

1. **Lower-division requirements (65 units minimum)**
   a) ENGR 001-I
   b) CS 010A, CS 010B, CS 010C, CS 061
   c) CS 011/MATH 011
   d) MATH 005A, MATH 005B, MATH 005C; or MATH 009A, MATH 009B, MATH 009C; MATH 010A; and either MATH 031 or EE 020B.
   e) PHYS 040A, PHYS 040B, PHYS 040C
   f) At least 8 additional units that are distinct from other requirements, 4 of which must be engineering depth electives and the remaining may be engineering breadth electives. Depth electives in this category include: BIEN 010, EE 020A & 30LA, EE 005, EE 016, EE 20A, ENSC 001, ENSC 002, MATH 010B, ME 002, ME 005, ME 018A, ME 018B, ME 009, ME 010; MATH 045/EE 020A, or MATH 46; or other engineering courses outside of the field of computer science to be selected in consultation with a faculty advisor. Breadth courses include: any depth course above or CHEM 001A or CHEM 01HA, CHEM 001B or CHEM 01HB, CHEM 001C or CHEM 01HC, CHEM 01LA or CHEM 1HLA, CHEM 01LB or CHEM 1HLB, CHEM 01LC or CHEM 1HLC, CHEM 008A or CHEM 008HA, CHEM 08LA or CHEM 08HLA, ECON 005, ECON 060, LING 020, LING 021, PHIL 125, PHIL 126, PHIL 127, STAT 004, STAT 008, STAT 010, or one selected in consultation with a faculty advisor. (Either a lower-division or an upper-division course may be used to satisfy this requirement).
2. **Upper-division requirements (79 units minimum)**
   a) ENGR 101-I
   b) CS 100, CS 141, CS 150, CS 152, CS 153, CS 161, CS 179 (E-Z)
   c) CS 120A/EE 120A
   d) CS 111
   e) ENGR 180W
   f) STAT 155
   g) At least 32 units of technical electives to be chosen from an approved list of courses which currently includes CS 105, CS 108, CS 110, CS 119L (4 units maximum), CS 120B/EE 120B, CS 122A, CS 122B, CS 130, CS 131, CS 133, CS 135, CS 142, CS 144, CS 145, CS 147, CS 160, CS 162, CS 164, CS 165, CS 166, CS 167, CS/EE 168, CS 169, CS 170, CS 171, CS 172, CS 173, CS 175, CS 177, CS 178B, CS 179 (E-Z) (4 units maximum), CS 180, CS 181, CS 182, CS 183, CS 193 (4 units maximum), MATH 120, MATH 126, MATH 135A, MATH 135B, PHIL 124..

   The technical electives selected must be distinct from those used to satisfy the requirements specified in 2.a)–f) above, with at least half of the (16) units selected from Computer Science courses.

Visit the Student Affairs Office in the College of Engineering or **student.engr.ucr.edu** for a sample program.

Computer Science with Business Applications Major

1. **Lower-division requirements (59 units)**
   a) ENGR 001M
   b) BUS 020
   c) CS 010A, CS 010B, CS 010C, CS 061
   d) CS 011/MATH 011
   e) ECON 002, ECON 003
   f) MATH 005A, MATH 005B, MATH 005C; or MATH 009A, MATH 009B, MATH 009C; MATH 010A; and either MATH 031 or EE 020B.
   g) One course of 4 or more units from ECON 005, ECON 060, STAT 004, STAT 008, STAT 010; MATH 045/EE 020A, or MATH 046; or one selected in consultation with a faculty advisor. (Either a lower-division or an upper-division course may be used to satisfy this requirement).
2. **Upper-division requirements (86 units)**
   a) ENGR 101M
   b) BUS 103, BUS 104/STAT 104, BUS 106/ECON 134
   c) CS 100, CS 141, CS 153
   d) At least two courses from CS 110, CS 160, CS 164, CS 166, CS 167, CS 169, CS 172, CS 180, CS 183
   e) CS 111
   f) ENGR 180W
   g) SOC 150 or SOC 151
   h) STAT 155
   i) At least twenty (20) units of Computer Science technical electives to be chosen from an approved list of courses which currently includes CS 105, CS 108, CS 110, CS 119L (4 units maximum), CS 120A, CS 120B, CS 122A, CS 122B, CS 130, CS 131, CS 133, CS 135, CS 142, CS 144, CS 145, CS/EE 147, CS 150, CS 152, CS 160, CS 161, CS 162, CS 164, CS 165, CS 166, CS 167, CS/EE 168, CS 169, CS 170, CS 171/EE 142, CS 172, CS 173, CS 175, CS 177, CS 178A, CS 178B, CS 179 (E-Z) (4 units maximum), CS 180, CS 181, CS 182, CS 183, CS 193 (4 units maximum).
   j) At least sixteen (16) units of Business Administration technical electives, including at least 8 units of courses listed in the information Systems concentration within the Business Administration major, which currently include BUS 110, BUS 125, BUS 128, BUS 163, BUS 166, BUS 171, BUS 172, BUS 173, BUS 174, BUS 175, BUS 179. Additionally, no credit will be given for BUS 101; and the following pairs of courses cannot both be taken for credit: BUS 125 and CS 177, BUS 163 and CS 175, BUS 171 and CS 180, BUS 173 and CS 166, BUS 175 and CS 164.

   The technical electives selected for 2.i)-j) must be distinct from those used to satisfy the requirements specified in 2.a)–h) above.

Students may petition for exceptions to the above degree requirements. Exceptions to Computer Science course requirements must be approved by the Computer Science and Engineering undergraduate advisor or chair.

Visit the Student Affairs Office in the College of Engineering or **student.engr.ucr.edu** for a sample program.

Minor in Computer Science

The minor in Computer Science is designed to enhance majors with limited computational theory or practice. As such, students with majors in Computer Engineering, Computer Science, Computer Science and Business Applications, Data Science, and Mathematics (Computational Mathematics option) are not eligible.

Requirements for the minor in Computer Science are:

1. Lower-division courses: CS 010A, CS 010B, CS 010C, CS 061, CS 011/MATH 011, MATH 009A, MATH 009B, MATH 009C
2. Core courses: CS 100, CS 111
3. Three elective courses, each of four or more units, such that:
   a) Each is an upper-division requirement or a listed technical elective for the Computer Science major, excluding

courses numbered 190-199

b) No course may be an upper-division requirement of the student's major

c) At least two courses must be in the Department of Computer Science and Engineering

4. All courses for the minor must be taken for a letter grade.

Note: Students with a minor in Computer Science must obtain approval from the undergraduate advisor in Computer Science and Engineering for a specific program of electives consistent with their career goals.

Graduate Program

The Department of Computer Science and Engineering offers the M.S. and Ph.D. degrees in Computer Science. General requirements are listed in the Graduate Studies section of this catalog. Specific requirements for each degree are described below.

Admission

All M.S. applicants must supply GRE General Test scores. For Ph.D. program applicants, GRE General Test scores are optional. Applicants should have at least an undergraduate degree in computer science or a closely related field, but applicants who fail to meet this criterion may sometimes be admitted with deficiencies.

Prerequisite Material

Competence in the areas defined by the following UCR courses is essential to graduate study in computer science:

CS 061, CS 141, CS 153

A student who is deficient in any of these competency areas may be asked to complete the corresponding UCR course with a letter grade of at least B+, or to pass a challenge examination based on that course's final exam with a grade of at least B+. All such remedial work should be completed within the first year of graduate study, and in all cases the deficiency must be corrected before a student can enroll in any graduate course from the same specialty area.

Core Areas

Students have considerable flexibility in selecting specialty area(s) within the program. However, the following core areas introduce fundamental concepts and tools of general interest to all students.

1. Hardware design principles: CS 203 or CS 220.
2. Theoretical foundations: CS 215 or CS 218.
3. Software and systems: CS 201 or CS 202.

Major Specialty Areas

The department has active research programs in the following major specialty areas. A list of related graduate courses is provided for each area.

A. **Algorithms, Bioinformatics, and Theory of Computation:** CS 214, CS 215, CS 218, CS 219, CS 234, CS 238

B. **Computer Architecture, Embedded Systems, and CAD:** CS 203, CS 213, CS 220, CS 223, CS 217/EE 217, EE 213, CS 251, EE 255

C. **Databases, Information Retrieval, Data Mining, and Machine Learning:** CS 205, CS 222, CS 224, CS 225, CS 226, CS 227, CS 229, CS 235, CS 236, CS 242, CS 228/EE 228, CS 248/EE 248, CS 252A/EE 252A, CS 258/EE 227, EE 243, EE 267, and EE 268

D. **Operating Systems, Distributed Systems, and High Performance Computing:** CS 202, CS 211, CS 237, CS 253, CS 255

E. **Computer Networks:** CS 204, CS 208, CS 237, CS 239, CS 240, CS 241, CS 254, CS 255, CS 257

F. **Programming Languages, Compilers, and Software Engineering:** CS 201, CS 206, CS 207, CS 246, CS 249

G. **Computer Graphics, Science Computing, and Human-Computer Interaction:** CS 210, CS 230, CS 231, CS 233, ME 230, ME 231

H. **Cybersecurity:** CS 216, CS 250, CS 254, CS 255

Master's Degree

The Department of Computer Science and Engineering offers the M.S. degree in Computer Science, after completion of the following degree requirements.

Course Requirements 48 quarter units of graduate or upper-division undergraduate courses are required. Students who have completed similar courses elsewhere may petition for a waiver of a required course or for substitution of an alternative course. For students interested in interdisciplinary research, individual study programs can be approved. All courses used to satisfy these requirements (with the exception of CS 297 and CS 299) must be taken for a letter grade. No course can be counted towards more than one category.

1. **Core Requirement (8 units).** Choose one course from two of the three Core Areas listed above, with no grade lower than B-.
2. **Breadth Requirement (8 units).** Two approved breadth courses. Among the four chosen core and breadth courses each must be selected from a different Major Specialty Area (A to H).
3. **Electives (32 units).** Students have the option of completing their degree by taking a comprehensive exam, writing a thesis, or completing a project. Depending on the option selected, the electives that may be taken are:

   a. **Comprehensive Examination Option.** For a student pursuing the M.S. degree, comprehensive examination option, the 32 elective units must include at least 16 units of approved graduate lecture courses. The remaining 16 units may include additional approved graduate lecture courses, up to 8 units of graduate seminars in CS 260–269, and up to 12 units of approved undergraduate technical electives. Research units (CS 297 or CS 299) may not be used to satisfy any course requirements under this option.

   b. **Project Option.** A student pursuing the M.S. degree, project option, may include up to 4 units of Directed Research (CS 297) towards the elective requirement. Of the remaining 28 units, at least 12 units must be approved graduate lecture courses. The remaining 16 units may include additional approved graduate lecture courses, up to 8 units of graduate seminars in CS 260–269, and up to 12 units of approved undergraduate technical electives.

   c. **Thesis Option.** A student pursuing the M.S. degree, thesis option, may include up to 12 units of graduate research (CS 297 or CS 299) towards the elective unit requirement. Of the remaining 20 units, at least 4 units must be approved graduate lecture courses. The remaining 16 units may include additional approved graduate lecture courses, up to 8 units of graduate seminars in CS 260–269, and up to 8 units of approved undergraduate technical electives.

Capstone Experience

All students must complete a capstone experience that synthesizes and integrates the knowledge and skills obtained throughout the master's program, by either passing a comprehensive exam, writing a thesis, or completing a project.The Comprehensive Examination Option is the default option. If a student choses the project or thesis option, it is the reponsibility of the student to find a faculty member willing to supervise the master's project or thesis, to form the faculty examining committee, and to schedule the oral examination.

a. **Comprehensive Examination Option**
Students must pass a comprehensive examination administered by the Department of Computer Science and Engineering.

b. **Project Option**
Students must complete a research project under the guidance of a faculty member. The project will be approved by a committee of at least two faculty members and requires a presentation and written report.

c. **Thesis Option**
Students must submit a master's thesis in accordance with the general requirements of the university. The thesis is original research work, and it should demonstrate the student's ability to study a research area, identify an open problem, and make a research contribution. The thesis requires a presentation and must be approved by a committee of at least three faculty members. The final thesis defense presentation can be taken in one of the following modes: In-Person, Hybrid or Remote. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. Students taking the exam In-Person are expected to present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the exam on campus in a video enabled room that supports some members physically present and others remote. The chair of the committee must be physically present for a Hybrid exam.

Normative Time to Degree 2 years.

Combined B.S. + M.S. Five-Year Program
The college offers combined five-year B.S. + M.S. programs designed to allow successful UCR Computer Science, Computer Science with Business Applications, or Computer Engineering B.S. graduates to complete the Master of Science degree in Computer Science in one year, by allowing up to 12 credits of coursework taken as a UCR undergraduate to be counted towards the 32-unit elective requirements of the M.S. (The courses that can be double counted are those that are eligible to be counted as Computer Science technical electives in the B.S. requirements.)

A student may apply at the start of their senior year by submitting an application to the Computer Science M.S. program, provided that at the end of junior year, the student was a UCR Computer Science, Computer Science with Business Applications, or Computer Engineering B.S. student. Applicants to the B.S. + M.S. programs are expected to have a cumulative GPA of at least 3.4 and a "core" course GPA of 3.2, so must have therefore completed at least three of the following "core" courses with no grade less than a B- and average grade at least 3.2: CS 100, CS 120A, CS 141, CS 153. The application to the M.S. program must include at least two recommendation letters from UCR Academic Senate faculty members (at least one, and preferably both, CSE faculty). Submission of GRE scores with the application is recommended but not required. Matriculation into the combined program occurs in the Fall term following senior year, provided: (a) the M.S. application is accepted, (b) throughout senior year, the student is a Computer Science, Computer Science with Business Applications, or Computer Engineering B.S. major with cumulative GPA 3.4 or higher, (c) no grade less than a B- and average grade at least 3.2 in all four of the core courses listed above prior to matriculation into the program, (d) by the end of senior year, the student completes the Computer Science, Computer Science with Business Applications, or Computer Engineering B.S. degree requirements.

Incoming students who are applying to the Computer Science, Computer Science with Business Applications, or Computer Engineering B.S. programs may simultaneously apply for preliminary admission into the combined program provided their high school GPA is at least 3.6, their SAT-I combined score is at least 1950, they satisfy the Entry Level Writing requirement before matriculation, and they have sufficient math preparation to enroll in calculus upon arrival. Preliminary admission status is maintained as long as the student is a Computer Science, Computer Science with Business Applications, or Computer Engineering B.S. student in good standing with a cumulative GPA of at least 3.4. Preliminarily admitted students still need to apply for full admission in their senior year as described above.

Five-year programs leading to M.S. degrees in other programs (including Computer Engineering) are also available. They are described separately in the catalog sections for those programs.

Doctoral Degree

The Department of Computer Science and Engineering offers the Ph.D. degree in Computer Science, after completion of the following degree requirements. It provides a research-oriented education in preparation for a career in research, industry, or academia and exploring both the fundamental aspects of computer science and engineering as well as their applications.

Course Requirements
The course requirements for the Ph.D. degree ensure that Ph.D. students are exposed to fundamental concepts and tools (core requirement), a deep up-to-date view of their research specialty area (depth requirement), and an advanced, up-to-date view of the same topics outside their area (breadth requirement). Students are expected to complete all of these course requirements in the first two years of the program. These requirements consist of 44 quarter units of approved graduate or upper-division undergraduate courses, satisfying all four of the following course work categories. All of these courses must be taken for a letter grade, and no course can be counted towards more than one category. Students who have completed similar courses elsewhere may petition for a waiver of a required course or for substitution of an alternative course.

Units obtained in CS 270, CS 287, CS 290, CS 297, CS 298, CS 299, and CS 302 cannot be counted in any course work category.

1. **Core Requirement (12 units).** Choose three courses from at least two of the three Core Areas described above, with no grade lower than B- and an overall core course GPA of at least 3.2.
2. **Depth Requirement (8 units).** Choose two courses listed above under the same Major Area (A to G). This requirement ensures that Ph.D. students, early on in their careers, acquire some depth of knowledge in a particular research area.
3. **Breadth Requirement (12 units).** Three courses from at least two different Major Areas (A to H) outside the student's depth area. No course that is listed in the student's depth area can be used to fulfill the breadth requirement, even if it is cross-listed in another area. Students, with the consent of the major professor, may petition for a non-CSE course to be counted towards the breadth requirement.
4. **Electives (12 units).** The remaining courses can be selected from additional CS graduate lecture courses, up to 8 units of graduate seminars in CS 260-269, and up to 8 units of approved undergraduate technical electives. Students, with the consent of the major professor, may petition for a non-CSE course to be counted as an elective.

Milestones
The Department has established three milestones to mark progress towards the Ph.D. degree in Computer Science: advancement to candidacy, presentation of the dissertation proposal, and final oral examination. A Ph.D. student must also satisfy all applicable Graduate Division requirements for each milestone.

Milestone I: Advancement to Candidacy. A student advances to candidacy after he/she has completed all of the Ph.D. course requirements described above, and passed the combined written and oral qualifying examinations, as described below. These two exams are intended to verify three components of the student's preparation for Ph.D. research: (1) breadth of comprehension sufficient to enable Computer Science research in areas beyond the topic(s) of the research exam and dissertation; (2) ability to perform critical study, analysis and writing in a focused area; and (3) demonstrated research experience or ability to do research.

Written Qualifying Examination
The written qualifying examination consists of a written report summarizing the oral presentation to be given at the oral qualifying examination. This report must be written in proper technical English and in the style of a typical Computer Science conference or journal publication, and must be submitted to the Qualifying Committee for approval at least one week prior to the oral qualifying examination.

Oral Qualifying Examination
The student is expected to demonstrate research aptitude by undertaking a research study on some topic (typically a problem from student's chosen research specialty that may be a promising area in which to conduct the dissertation research), under the guidance of his or her faculty major professor. The research must be presented orally to a Qualifying Committee, which is appointed by the Graduate Division based on nominations from the department. The committee will consist of at least four Senate faculty members, with at least three members whose home department is CSE. The committee evaluates the merits of the work and the student's aptitude for research. The work must represent significant progress towards original and publishable research. The student must complete this requirement in no more than two attempts. The normative time for taking the Oral Qualifying Exam is by the end of the third year. The Oral Qualifying Exam can be taken in one of the following modes: In Person, Hybrid, or Remote. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. Students taking the exam In-Person are expected to present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the exam on campus in a video enabled room that supports some members physically present and others remote. The chair of the committee must be physically present for a Hybrid exam.

Dissertation Committee
After advancing to candidacy, the student must form a Doctoral Examination Committee chaired by his or her major professor. The committee will consist of at least four senate faculty members with at least three members belonging to the CSE department (their home department is CSE).

Milestone II: Dissertation Proposal Examination
After advancement to candidacy, the student prepares a dissertation proposal that describes the dissertation topic, summarizes the relevant background literature, and presents a comprehensive research plan for the doc-

toral dissertation. The Dissertation Proposal Examination evaluates appropriateness of the research topic and the feasibility of the research plan. It also establishes a realistic timeline for the completion of the Dissertation. The Dissertation Committee administers this exam. The normative time for the Dissertation Proposal Exam is by the end of the third year. The Dissertation Proposal exam must be taken at least six months prior to the Final Doctoral Examination.

Milestone III: Final Doctoral Examination
The student is required to write a dissertation in accordance with the Graduate Division requirements and may be required to defend it in a public oral final doctoral examination to the Dissertation Committee. After a satisfactory performance on the final doctoral examination, the Dissertation Committee recommends granting the Ph.D. degree. The student's research and the dissertation must both meet the highest standards of originality and scholarship.

The normative time for the completion of a Ph.D. in Computer Science is five years.

The Oral Qualifying Exam can be taken in one of the following modes: In Person, Hybrid, or Remote. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. Students taking the exam In-Person are expected to present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the exam on campus in a video enabled room that supports some members physically present and others remote. The chair of the committee must be physically present for a Hybrid exam.

Professional Development Requirement
MS students must satisfactorily complete one of the following courses: one quarter of CS 287, GDIV 403 or at least one unit of CS 298I. Other professional development courses may be used to satisfy this requirement if approved by the graduate advisor. PhD students must satisfactorily complete six quarters of CS287.

Lower-Division Courses

CS 005 Introduction to Computer Programming 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. An introduction to computer programming for nonengineering and nonscience majors and for those considering taking CS 010A but needing additional preparation. Topics include the history of computing, basic computer operation, the notion of an algorithm, and programming constructs such as variables, expressions, input/output, branches, loops, functions, parameters, arrays, and strings. Credit is not awarded for CS 005 if it has already been awarded for CS 010A.

CS 006 Effective Use of the World Wide Web 4 Lecture, 3 hours; laboratory, 3 hours. A detailed introduction to the Internet for non-engineering majors. Covers Web tools, e-communities, e-commerce, power searching, and verification of information, privacy, and other legal and societal issues.

CS 008 Introduction to Computing 4 Lecture, 3 hours; laboratory, 3 hours. Includes operating system basics (Windows and Unix), word processing, spreadsheets, databases (e.g., Access), e-mail, the Internet, and the World Wide Web. Designed for students not majoring in computer science, engineering, mathematics, or science. Credit is not awarded for CS 008 if it has already been awarded for CS 010A.

CS 009A Data Oriented Introduction to Computing I 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): MATH 004, may be taken concurrently or MATH 005A, may be taken concurrently or MATH 006A, may be taken concurrently or MATH 006B, may be taken concurrently or MATH 007A, may be taken concurrently or MATH 009A, may be taken concurrently or MATH 09HA, may be taken concurrently or MATH 022, may be taken concurrently. Covers computational thinking, problem-solving, and data analysis using the Python language through application-based data manipulation tasks from science, engineering, business, and the humanities. Includes variables, expressions, branches, loops, functions, parameters, lists, strings, file I/O, and exception handling. Also covers software design, testing, and debugging. Credit is awarded for one of the following CS 009A or CS 010A. Credit is not awarded for CS 005 or CS 008 if it has already been awarded for CS 009A.

CS 009B Data Oriented Introduction to Computing II 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 009A with a grade of C- or better, CS 09HA with a grade of C- or better; or equivalent. Covers advanced programming concepts and algorithms through application-based data manipulation tasks from science, engineering, business, and the humanities. Emphasizes good programming principles in the design and development of substantial programs using the Python language. Topics include abstract data types, objects and classes, recursion, and basic software engineering principles. Credit is awarded for one of the following CS 009B or CS 010B.

CS 009C C++ For Programmers 2 Lecture, 1 hour; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 009B, may be taken concurrently; MATH 006B, may be taken concurrently or MATH 007A, may be taken concurrently or MATH 005A, may be taken concurrently or MATH 004, may be taken concurrently or MATH 009A, may be taken concurrently or MATH 09HA, may be taken concurrently. Introduces the constructs provided in the C++ programming language for procedural and object-oriented programming. For those with prior programming experience.

CS 010A Introduction to Computer Science For Science, Mathematics, and Engineering I 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): MATH 005A, may be taken concurrently or MATH 006A, may be taken concurrently or MATH 006B, may be taken concurrently or MATH 007A, may be taken concurrently or MATH 009A, may be taken concurrently or MATH 09HA. Covers problem solving through structured programming of algorithms on computers using the C++ object-oriented language. Includes variables, expressions, input/output (I/O), branches, loops, functions, parameters, arrays, strings, file I/O, and classes. Also covers software design, testing, and debugging. Credit is awarded for one of the following CS 010A or CS 009A. Credit is not awarded for CS 005 or CS 008 if it has already been awarded for CS 010A.

CS 010B Introduction to Computer Science For Science, Mathematics, and Engineering 2 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 010A with a grade of C- or better; familiarity with C or C++ language. Covers structured and object-oriented programming in C++. Emphasizes good programming principles and development of substantial programs. Topics include recursion, pointers, linked lists, abstract data types, and libraries. Also covers software engineering principles. Credit is awarded for one of the following CS 010B or CS 009B.

CS 010C Introduction to Data Structures and Algorithms 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 010B with a grade of C- or better or CS 009C with a grade of C- or better; proficiency in C++. Topics include basic data structures such as arrays, lists, stacks, and queues. Covers dictionaries (including binary search trees and hashing) and priority queues (heaps). Offers an introductory analysis of algorithms, sorting algorithms, and object-oriented programming including abstract data types, inheritance, and polymorphism. Explores solving complex problems through structured software development.

CS 011 Introduction to Discrete Structures 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010A or MATH 005C or MATH 007B or MATH 009B or MATH 09HB. Introduction to basic concepts of discrete mathematics emphasizing applications to computer science. Topics include propositional and predicate calculi, elementary set theory, functions, relations, proof techniques, elements of number theory, enumeration, and discrete probability. Cross-listed with MATH 011.

CS 015 Introduction to Data Science 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 009A with a grade of C- or better. Provides an introduction to data science with an emphasis on empirical analysis of real-world data sets through computation. Explores critical concepts and skills in computer programming and statistical inference. Covers the Data Science life-cycle including data collection, data cleaning and integration, visualization, and analysis.

CS 042 A Hitchhiker's Guide to Artificial Intelligence (ai) 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Surveys basic concepts and techniques underpinning modern AI including problem solving, automated reasoning, game AI, vision and language, neural networks, and robotics. Explores history, ethics, use cases, and applications. Introduces basic use of Python for building and using AI but expects no prior

experience. Intended for non-engineering majors.

CS 061 Machine Organization and Assembly Language Programming 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 009A with a grade of C- or better or CS 010A with a grade of C- or better. An introduction to computer organization. Topics include number representation, combinational and sequential logic, computer instructions, memory organization, addressing modes, interrupt, input/output (I/O), assembly language programming, assemblers, and linkers.

Upper-Division Courses

CS 100 Software Construction 5 Lecture, 3 hours; laboratory, 2 hours; discussion, 1 hour; individual study, 1 hour. Prerequisite(s): CS 010C with a grade of C- or better. Emphasizes development of software systems. Topics include design and implementation strategies and selection and mastery of programming languages, environment tools, and development processes. Develops skill in programming, testing, debugging, performance evaluation, component integration, maintenance, and documentation. Covers professional and ethical responsibilities and the need to stay current with technology.

CS 105 Data Analysis Methods 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 009B with a grade of C- or better or CS 010B with a grade of C- or better; restricted to class level standing of sophomore, junior, senior, or masters. An introduction to fundamental concepts and methods in data analysis and visualization essential to a variety of data science tasks. Designed to provide preparation for the data science major and for advanced courses in data analysis and applications of data science.

CS 106 Introduction to Computer Security 4 Lecture, 3 hours; laboratory, 1.5 hours; individual study, 1.5 hours. Prerequisite(s): CS 011 or MATH 011; CS 061; CS 010C; or consent of instructor. Introduction to security in computer systems and online services for computing majors. Studies security impact in computer science. Topics include both offensive and defensive security techniques, security mindset and concepts, and applications to real-world problems.

CS 108 Data Science Ethics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 105 or STAT 107 or CS 171; or consent of instructor. Covers ethics specifically related to data science. Topics include data privacy; data curation and storage; discrimination and bias arising in the machine learning process; statistical topics such as generalization, causality, curse of dimensionality, and sampling bias; data communication; and strategies for conceptualizing, measuring, and mitigating problems in data-driven decision-making. Cross-listed with STAT 108. Credit is awarded for one of the following CS 108, STAT 108, CS 212, or STAT 212.

CS 110 Principles of Web Development 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 100. Provides an introduction to distributed systems, with a focus on web development techniques and the considerations to application scalability, security, reliability, and redundancy. Provides an in-depth study of technologies used for both back-end and front-end development, and how to design robust applications in the webs constantly evolving landscape.

CS 111 Discrete Structures 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010A; CS 011 or MATH 011; MATH 009C or MATH 09HC; MATH 031 or EE 020B. A study of discrete mathematical structures emphasizing applications to computer science. Topics include number theory and cryptography, asymptotic notation, recurrence equations, counting methods, elements of graph theory, and trees.

CS 119L Laboratory in Problem Solving and Programming 2 Laboratory, 3 hours; individual study, 3 hours. Prerequisite(s): CS 010C with a grade of C- or better; CS 111 recommended; or consent of instructor. Explores techniques and skills applicable in developing software solutions to real-life algorithmic problems. Emphasizes systematic and rigorous approaches to problem-solving. Covers the end-to-end solution process including formulating models, choosing appropriate algorithmic tools and data structures, designing algorithms, implementation, and testing. Course is repeatable to a maximum of 4 units.

CS 120A Logic Design 5 Lecture, 3 hours; laboratory, 3 hours; individual study, 3 hours. Prerequisite(s): CS 061 with a grade of C- or better. Covers design of digital systems. Includes Boolean algebra; combinational and sequential logic design; design and use of arithmetic logic units, carry-lookahead adders, multiplexors, decoders, comparators, multipliers, flip-flops, registers, and simple memories; state-machine design; and basic register-transfer level design. Uses hardware description languages, synthesis tools, programmable logic, and significant hardware prototyping. Cross-listed with EE 120A.

CS 120B Introduction to Embedded Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010C with a grade of C- or better or EE 016 with a grade of C- or better; CS 120A with a grade of C- or better or EE 120A with a grade of C- or better. Introduction to hardware and software design of digital computing systems embedded in electronic devices (e.g., digital cameras or portable video games). Includes embedded processor programming, standard peripherals, interfacing, and hardware/software tradeoffs. Involves use of microcontrollers and developing working embedded systems. Cross-listed with EE 120B.

CS 122A Intermediate Embedded and Real-Time Systems 5 Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): CS 010B; CS 120B or EE 120B. Covers software and hardware design of embedded computing systems. Includes hardware and software codesign, advanced programming paradigms (including state machines and concurrent processes), real-time programming, operating systems, basic control systems, modern chip, and design technologies. Laboratories involve use of microcontrollers, embedded microprocessors, programmable logic, advanced simulation, and debug environments.

CS 122B Advanced Embedded and Real-Time Systems 5 Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): CS 122A. Explores state-of-the-art aspects of building embedded computer systems. Topics include real-time programming, synthesis of coprocessor cores, application-specific processors, hardware and software cosimulation and codesign, low-power design, reconfigurable computing, core-based design, and platform-based methodology.

CS 130 Computer Graphics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 100; MATH 031, may be taken concurrently or EE 020B, may be taken concurrently; or consent of instructor. A study of the fundamentals of computer graphics necessary to design and build graphics applications. Examines raster graphics algorithms including scan-converting graphics primitives, anti-aliasing, and clipping. Also covers geometric transformations, viewing, solid modeling techniques, hidden-surface removal algorithms, color models, illumination, and shading.

CS 131 Edge Computing 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 100 or EE 120B or CS 120B. Covers industry standards for quality of service and security while leveraging performance constraints. Develops skill in deploying real-world applications using embedded artificial intelligence. Cross-listed with EE 131.

CS 133 Computational Geometry 4 Lecture, 3 hours; laboratory, 1 hour; individual study, 2 hours. Prerequisite(s): CS 100, CS 111, MATH 031; or equivalents. An introduction to the design of geometry algorithms. Covers the basic computational geometry concepts and techniques used in graphics, robotics, and engineering design. Topics include polygons and polytopes, convex hulls, and voronoi diagrams.

CS 135 Virtual Reality 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 100. Covers the development of virtual reality (VR) worlds, including motion and physics of VR worlds. Includes design practices for immersive experiences, human visual perception, environmental and social interactions. Also includes positional tracking with sensors, augmented and mixed reality, and storage and transmission of virtual reality worlds.

CS 141 Intermediate Data Structures and Algorithms 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010C with a grade of C- or better; CS 111; MATH 009C or MATH 09HC; proficiency in C++. Explores basic algorithm analysis using asymptotic notations, summation and recurrence relations, and

algorithms and data structures for discrete structures including trees, strings, and graphs. Also covers general algorithm design techniques including "divide-and-conquer," the greedy method, and dynamic programming. Integrates knowledge of data structures, algorithms, and programming.

CS 142 Algorithm Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 100, CS 141; or equivalent. Covers the design and implementation of sequential, parallel, cache-efficient, external-memory, and write-efficient algorithms for fundamental computational problems including sorting, searching, as well as a selection of problems in algebra, geometry, combinatorial optimization, and string processing. Emphasizes practical aspects of algorithm design, efficient implementation, and experimental methodology for performance evaluation.

CS 144 Algorithms For Bioinformatics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 141. Introduces fundamental algorithms and data structures for solving analytical problems in molecular biology and genomics. Includes exact and approximate string matching; sequence alignment; genome assembly; and gene and regulatory motifs recognition. Credit is awarded for one of the following CS 144, CS 234, or CS 238.

CS 145 Combinatorial Optimization Algorithms 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 141; MATH 031 or MATH 131. The study of efficient algorithm design techniques for combinatorial optimization problems. Topics include shortest paths, minimum spanning trees, network flows, maximum matchings, stable matchings, linear programming, duality, two-person games, algorithmic techniques for integer programming problems, NP-completeness, and approximation algorithms.

CS 147 Graphics Processing Unit Computing and Programming 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 120B or CS 120B. Introduces principles and practices of programming graphics processing units (GPUs) using the parallel programming environment. Covers memory/threading models, common data-parallel programming patterns and libraries needed to develop high-performance parallel computing applications. Examines computational thinking; a broader range of parallel execution models; and parallel programming principles. Cross-listed with EE 147.

CS 148 Artificial Intelligence For Robotics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MATH 031 or EE 020B or ME 0188; EE 016 or CS 100; restricted to class level standing of junior, senior, or masters; or consent of instructor. Covers essential aspects of intelligent robot behavior focusing on reactive, deliberative, and interactive capabilities for safe, efficient interactions with environments, other robots, and humans. Discusses planning, actions, knowledge representation, perception-action feedback loops, decision-making under uncertainty, task and motion planning, robot learning, and ethical considerations in autonomous robot design. Cross-listed with EE 148.

CS 150 Automata and Formal Languages 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010C with a grade of C- or better; CS 111; MATH 009C or MATH 09HC. A study of formal languages. Includes regular and context-free languages; computational models for generating these languages such as finite-state automata, pushdown automata, regular expressions, and context-free grammars; mathematical properties of the languages and models; and equivalence between the models. Also introduces Turing machines and decidability.

CS 152 Compiler Design 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 061; CS 100; CS 111; CS 150. Covers the fundamentals of compiler design. Includes lexical analysis, parsing, semantic analysis, compile-time memory organization, run-time memory organization, code generation, and compiler portability issues.

CS 153 Design of Operating Systems 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 061; CS 100; CS 111; C++ programming proficiency. Covers the principles and practice of operating system design. Includes concurrency, memory management, file systems, protection, security, command languages, scheduling, and system performance.

CS 160 Concurrent Programming and Parallel Systems 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 061; CS 100; CS 111. A study of concurrent and parallel systems. Topics include modular structure and design, interprocess communication, synchronization, failures, persistence, and concurrency control. Also covers atomic transactions, recovery, language support, distributed interprocess communication, and implementation mechanisms. Provides preparation for the study of operating systems, databases, and computer networking.

CS 161 Design and Architecture of Computer Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 120A or CS 120A. A study of the fundamentals of computer design. Topics include the performance evaluation of microprocessors; instruction set design and measurements of use; microprocessor implementation techniques including multicycle and pipelined implementations; computer arithmetic; memory hierarchy; and input/output (I/O) systems.

CS 161L Laboratory in Design and Architecture of Computer Systems 2 Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 161 (may be taken concurrently). Covers the design and simulation of a complete computer system using hardware description language and simulator. Topics include instruction set architecture design; assemblers; datapath and control unit design; arithmetic and logic unit; memory and input/output (I/O) systems; and integration of all parts into a working computer system.

CS 162 Computer Architecture 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 161 with a grade of "C-" or better. The study of advanced processor design. Topics include CPU pipelining, data and control hazards, instruction-level parallelism, branch prediction, and dynamic scheduling of instructions. Also covers Very Long Instruction Word (VLIW) processing, multimedia support, design of network and embedded processors, basic multiprocessor design, shared memory and message passing, and network topologies.

CS 163 Introduction to Privacy Technologies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 100; CS 165 is recommended; restricted to class level standing of junior, or senior; or consent of instructor. Covers issues regarding privacy in computer systems and online services. Introduces techniques for mitigating privacy threats through security and cryptography controls. Topics also include socio-technical aspects of privacy including law, ethics, and psychology.

CS 164 Computer Networks 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 100; CS 111; CS 153. Covers the fundamentals of computer networks. Topics include layered network architecture, communication protocols, local area networks, UNIX network programming, verification, network security, and performance studies.

CS 165 Computer Security 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 141, CS 153. Examines the ways in which information systems are vulnerable to security breaches. Topics include attacks; security labels, lattices, and policies; safeguards and countermeasures; intrusion detection; authorization and encryption techniques; networks; digital signatures, certificates, and passwords; privacy issues, firewalls, and spoofing; Trojan horses and computer viruses; CERT Coordination Center; and electronic commerce.

CS 166 Database Management Systems 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 100; CS 111. Covers basic concepts of databases and database management systems. Topics include entity-relationship modeling for design, relational data model, relational algebra, Structured Query Language (SQL), secondary storage, indexing and hashing, query evaluation and optimization, and overview of transactions.

CS 167 Introduction to Big-Data Management 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 100, CS 111; CS 167 online section: enrollment in the online Master-of-Science in Engineering program. Introduces the architecture of big-data systems and their applications in data management and processing. Describes the common functionality in big-data processing such as distributed storage, resource management,

query processing, fault-tolerance, and programming APIs. Covers the popular big-data technologies such as distributed shared-nothing systems, NoSQL processing model, and semi-structured data management.

CS 168 Introduction to Very Large Scale Integration Design 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 120A or EE 120A; or consent of instructor. Studies integrated circuit fabrication, device characterization, and circuit simulation. Introduces basic device physics and physical design rules, MOS logic design, and timing and clock schemes. Covers layout generation, subsystem designs, and circuits for alternative logic styles. Also covers design and simulation using hardware description language and CAD tools. Cross-listed with EE 168. Credit is awarded for one of the following EE 168, CS 168, or EE 282A.

CS 169 Mobile Wireless Networks 4 Lecture, 3 hours; laboratory, 2 hours; extra reading, 1 hour. Prerequisite(s): CS 153 or consent of instructor. Introduces the fundamentals of wireless and mobile networks. Covers wireless channel models, MAC protocols, and wireless network architectures. Also covers cellular, WLAN and ad hoc networks, and routing in multi-hop wireless networks. Includes wireless security and the impact of wireless links on TCP and other transport layer solutions.

CS 170 Introduction to Artificial Intelligence 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 100 with a grade of "C-" or better, CS 111. An introduction to the field of artificial intelligence. Focuses on discrete-valued problems. Covers heuristic search, problem representation, and classical planning. Also covers constraint satisfaction and logical inference.

CS 171 Introduction to Machine Learning and Data Mining 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A; MATH 031 or EE 020B; STAT 155 or EE 114 or STAT 156A; CS 100 or EE 016. Introduces formalisms and methods in data mining and machine learning. Topics include data representation, supervised learning, and classification. Covers regression and clustering. Also covers rule learning, function approximation, and margin-based methods. Cross-listed with EE 142.

CS 172 Introduction to Information Retrieval 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 100; CS 111; EE 114 or STAT 155 or STAT 156A or STAT 160A. Introduces information retrieval (IR) principles and techniques for indexing and searching document collections. Topics include Web search, text processing, ranking algorithms, search in social networks, and search evaluation. Also studies scalability issues in search engines.

CS 173 Introduction to Natural Language Processing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 100; CS 111; EE 114 or STAT 155 or STAT 156A or STAT 160A. An overview of modern approaches for natural language processing. Focuses on major algorithms used in NLP for various applications such as part-of-speech tagging, parsing, named entity recognition, coreference resolution, sentiment analysis, and machine translation.

CS 175 Entrepreneurship in Computing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 100; restricted to class level standing of junior, or senior. Introduces business and technological concepts to create companies based on computer technology. Covers technical aspects of real-world IT projects. Includes developing software and services; understanding user requirements; designating usable systems; and assessing technology. Addresses market analysis and strategy; legal and intellectual property; ethics and communication issues; and financial analysis.

CS 177 Modeling and Simulation 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 100; CS 111; C++ programming proficiency. Covers validation of random number sequences; concepts in modeling and systems analysis; and conceptual models and their mathematical and computer realizations. Examines simulation modeling techniques including object-oriented modeling and discrete-event modeling. Emphasizes the use of simulation libraries used with programming languages such as C++.

CS 178A Project Sequence in Computer Science and Engineering 4 Lecture, 1 hour; laboratory, 2 hours; individual study, 1 hour; practicum, 6 hours. Prerequisite(s): CS 141, ENGR 180W; restricted to class level standing of senior. Incorporates the proposal, design, building, testing, and documenting of software and hardware devices or systems under the direction of a faculty member. Emphasizes professional and ethical responsibilities and the need to stay current on technology and its global impact on economics, society, and the environment. Completed together, CS 178A and CS 178B may be applied as a substitute for the CS 179 (E-Z) CS major requirement. Graded In Progress (IP) until CS 178A and CS 178B are completed, at which time, a final letter grade is assigned.

CS 178B Project Sequence in Computer Science and Engineering 4 Lecture, 1 hour; laboratory, 2 hours; individual study, 1 hour; practicum, 6 hours. Prerequisite(s): CS 178A; restricted to class level standing of senior. Incorporates the proposal, design, building, testing, and documenting of software and hardware devices or systems under the direction of a faculty member. Emphasizes professional and ethical responsibilities and the need to stay current on technology and its global impact on economics, society, and the environment.

CS 179 (E-Z) Project in Computer Science 4 Prerequisite(s): CS 100 with a grade of C- or better; CS 152 with a grade of C- or better; ENGR 180W. For hours and prerequisites, see segment descriptions. Under the direction of a faculty member, student teams propose, design, build, test, and document software and/or hardware devices or systems. Emphasizes professional and ethical responsibilities and the need to stay current on technology and its global impact on economics, society, and the environment.

CS 179E Project in Computer Science: Compilers 4 Discussion, 1 hour; laboratory, 3 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): CS 100 and CS 152 with grades of "C-" or better; ENGR 180W; 8 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of a compiler-related system. Incorporates techniques from previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

CS 179F Project in Computer Science: Operating Systems 4 Discussion, 1 hour; laboratory, 3 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): CS 153 with a grade of "C-" or better; ENGR 180W; 8 additional upper-division units in Computer Science. CS 160 is recommended. Covers the planning, design, implementation, testing, and documentation of an operating systems-related system. Incorporates techniques from previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

CS 179G Project in Computer Science: Database Systems 4 Discussion, 1 hour; laboratory, 3 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): CS 100 with a grade of C- or better; CS 166 with a grade of C- or better or CS 167 with a grade of C- or better, ENGR 180W; 8 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of a database-related system. Incorporates techniques from previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

CS 179I Project in Computer Science: Networks 4 Discussion, 1 hour; laboratory, 3 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): CS 100 and CS 164 with grades of "C-" or better; ENGR 180W; 8 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of a network-related system. Incorporates techniques from previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

CS 179J Project in Computer Science: Computer Architecture and Embedded Systems 4 Discussion, 1 hour; laboratory, 3 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): CS 100, CS 111, CS 120B/EE 120B, and CS 161 with grades of "C-" or better or consent of instructor; ENGR 180W; 3 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of a computer architecture and embedded

systems-related system. Incorporates using techniques presented in previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

CS 179K Project in Computer Science: Software Engineering 4 Discussion, 1 hour; laboratory, 3 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): CS 180; ENGR 180W; 8 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of a software engineering-related system. Incorporates techniques presented in previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

CS 179M Project in Computer Science: Artificial Intelligence 4 Discussion, 1 hour; laboratory, 3 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): CS 100, CS 111, and CS 170 with grades of "C-" or better; ENGR 180W; 8 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of an artificial intelligence-related system. Incorporates techniques presented in previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

CS 179N Project in Computer Science: Graphics and Electronic Games 4 Discussion, 1 hour; laboratory, 3 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): CS 130 with a grade of C- or better; ENGR 180W; 8 additional upper-division units in Computer Science. Covers the planning, design, implementation, testing, and documentation of a graphics or electronic game-related system. Incorporates using techniques presented in previous related courses. Emphasizes professional and ethical responsibilities; the need to stay current on technology; and its global impact on economics, society, and the environment.

CS 180 Introduction to Software Engineering 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 100. A study of software engineering techniques for the development, maintenance, and evolution of large software systems. Topics include requirements and specification; system design and implementation; debugging, testing, and quality assurance; reengineering; project management; software process; tools; and environments.

CS 181 Principles of Programming Languages 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 061; CS 100; CS 111. Covers the principles of programming language design. Includes the study and comparison of several programming languages, their features, and their implementations.

CS 182 Software Testing and Verification 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 100. A study of modern techniques to assess the quality of software artifacts through functional, performance, and reliability testing. Introduces black box and white box testing techniques. Covers the application of modern testing tools to software units, components, subsystems, and entire systems. Also covers verification as a complementary technique to testing.

CS 183 Unix System Administration 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 100. Explores the technical aspects of system administration on a Unix system including advanced Unix. Includes managing system devices, operating system installation, communications, and networking.

CS 189 Apprentice Tutoring 1 Activity, 3 hours. Prerequisite(s): permission established by computer science faculty and consent of instructor. Aids in the learning of effective tutoring methods, such as best practices for leading Computer Science tutoring sessions, growth mindset, learning modalities, and student relations. Graded Satisfactory (S) or No Credit (NC).

CS 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): consent of instructor and department chair. Individual study to meet special curricular needs. Course is repeatable to a maximum of 9 units.

CS 191 Seminar in Research Topics in Computer Science and Engineering 1 Seminar, 1 hour. Prerequisite(s): upper division or graduate standing or consent of instructor. An introduction to the range of research topics and methods in Computer Science and Engineering and to the research opportunities available within the department. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units.

CS 193 Design Project 1 to 4 Laboratory, 1 to 6 hours; scheduled research, 1 to 3 hours; individual study, 1 to 3 hours, Prerequisite(s): CS 141; consent of instructor. Individual hardware or software design project to include establishment of objectives and criteria, synthesis, analysis, implementation, testing, and documentation. Course is repeatable to a maximum of 8 units.

CS 194 Independent Reading 1 to 4 Prerequisite(s): consent of instructor. Independent reading in material not covered in course work. Normally taken in senior year. Total credit for CS 194 may not exceed 8 units.

CS 198I Individual Internship in Computer Science 1 to 4 Internship, 3 to 12 hours. Prerequisite(s): upper-division standing; at least 12 units in Computer Science courses. An academic internship to provide the student with career experience as a computer scientist in a governmental, industrial, or research unit under the joint supervision of an off-campus sponsor and a faculty member in Computer Science. Each individual program must have the prior approval of both supervisors and the Department chair. A final written report is required. Course is repeatable to a maximum of 8 units.

Graduate Courses

CS 201 Compiler Construction 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 152; graduate standing. Covers theory of parsing and translation. Also addresses compiler construction including lexical analysis, syntax analysis, code generation, and optimization. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 202 Advanced Operating Systems 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 153; graduate standing. Examines recent developments in operating systems. Also covers multiprogramming, parallel programming, time sharing, scheduling and resource allocation, and selected topics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 203 Advanced Computer Architecture 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 161; graduate standing. Covers contemporary computer systems architecture including pipelined CPU design, instruction level parallelism, memory hierarchy, thread level parallelism, introduction to multiprocessing, and evaluation of computer performance. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 204 Advanced Computer Networks 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 010C with a grade of C- or better, CS 164; graduate standing. Covers advanced topics in computer networks, layering, Integrated Services Digital Networks (ISDN), and high-speed networks. Also covers performance models and analysis, distributed systems and databases, and case studies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 205 Artificial Intelligence 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 170; or equivalent; graduate standing. Examines knowledge representation and automated reasoning and their use in capturing common sense and expert knowledge. Also addresses predicate and nonmonotonic logics; resolution and term rewriting; reasoning under uncertainty; theorem provers; planning systems; and belief networks. Includes topics in natural language processing, perception, logic programming, expert systems, and deductive databases. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 206 Advanced Software Testing and Analysis 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): CS 141, CS 150; or equivalents; graduate standing. Introduces techniques to verify that software runtime behavior meets its specifications. Topics include model checking (safety, liveness, temporal logics, and abstraction); static and dynamic analysis (data flow analysis, concept analysis, program slicing, and invariant detection); testing (test generation, prioritization, suite reduction, and regression); and automated debugging (fault location and

visualization). May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 207 Advanced Programming Languages 4 Lecture, 3 hours; research, 1.5 hours; written work, 1.5 hours. Prerequisite(s): CS 152, CS 181, or equivalents; graduate standing. Introduces the techniques for analyzing program semantics and correctness. Covers simply-typed lambda calculus as well as basic and advanced type systems. Presents axiomatic, operational, and denotational semantics. Explores programming-language constructs and tools for specifying, reasoning, and verifying correctness properties. Includes safe memory accesses and safe concurrent programming or security. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 208 Cloud Computing and Cloud Networking 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 164, CS 153, or equivalent. Covers cloud computing concepts. Introduces operating system virtualization techniques enabling multi-tenant cloud computing. Study of operating system scheduling concepts, virtualization, cloud resource management, VM migration and security. Overview of data center networking, networking cloud data centers, virtual private clouds, replication, disaster recovery and green computing. Examination of commercial cloud platforms.

CS 210 Scientific Computing 4 Lecture, 4 hours. Prerequisite(s): CS 010B, MATH 010A; MATH 031 or equivalent; graduate standing; or consent of instructor. Utilizes scientific computing in a specific computer science research area. Provides a foundation for pursuit of further studies of special topics in scientific computing. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 211 High Performance Computing 4 Lecture, 3 hours. Prerequisite(s): CS 161; graduate standing; or consent of instructor. Introduces performance optimization for sequential computer programs. Covers high performance computing on multicore shared memory computers and on distributed memory computing clusters. Also covers high performance scientific libraries and computing application development using pthreads, OpenMP, and Message Passing Interface (MPI) parallel file systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 212 Data Science Ethics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 252A or EE 251A or CS 235 or CS 224 or STAT 207 or STAT 208; graduate standing. Covers ethics specifically related to data science. Includes data privacy; data curation and storage; discrimination and bias arising in the machine learning process; statistical topics such as generalization, causality, curse of dimensionality, and sampling bias; data communication; and strategies for conceptualizing, measuring, and mitigating problems in data-driven decision-making. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with STAT 212. Credit is awarded for one of the following CS 212, STAT 212, CS 108, or STAT 108.

CS 213 Multiprocessor Architecture and Programming 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 203; graduate standing; or consent of instructor. Introduces multi-processing, multicore architectures, and CC-NuMA multiprocessors. Also covers heterogeneous multiprocessors and interconnection networks. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 214 Parallel Algorithms 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 141; or equivalent; graduate standing. Covers basic concepts of parallel shared-memory algorithms such as theoretical models, scheduling, and concurrency. Addresses techniques for designing efficient parallel algorithms for computational problems in a variety of areas including sorting, searching, algebra, graph theory, data structures, computational geometry, and scheduling. Emphasizes correctness proofs and rigorous performance analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 215 Theory of Computation 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 150; graduate standing. Covers phrase structure grammars and languages; turing machines; relation of languages to automata; solvable and unsolvable problems; and theoretical limitations of computers. Also examines algorithmic complexity theory; polynomial reducibility; the classes P and NP; and correctness proofs. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 216 Advanced Cryptography 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): CS 141, CS 150; or equivalents; graduate standing. Introduction to advanced cryptography. Covers formal models of security and applications including public key encryption, digital signatures, and secure protocols. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 217 Graphics Processing Unit Architecture and Parallel Programming 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): CS 160 with a grade of "C-" or better; graduate standing; or consent of instructor. Introduces the popular CUDA based parallel programming environments based on Nvidia GPUs. Covers the basic CUDA memory/threading models. Also covers the common data-parallel programming patterns needed to develop a high-performance parallel computing applications. Examines computational thinking; a broader range of parallel execution models; and parallel programming principles. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 217.

CS 218 Design and Analysis of Algorithms 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 141; graduate standing. Covers efficient algorithms and data structures for problems from a variety of areas such as sorting, searching, selection, linear algebra, graph theory, and combinatorial optimization. Focuses on techniques for algorithm design (greedy, divide-and-conquer, dynamic programming) and rigorous proofs of correctness and time- and space-complexity (amortized analysis, Master Theorem). May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 219 Advanced Algorithms 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 218; or equivalent; graduate standing. Covers advanced techniques for the design and analysis of algorithms and data structures. Topics include linear and integer programming, randomized algorithms, approximation algorithms, online algorithms, parallel algorithms, and distributed algorithms. Emphasizes formal proofs of correctness and rigorous performance analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 220 Synthesis of Digital Systems 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 141, CS 161; graduate standing. Covers the synthesis and simulation of digital systems. Topics include synthesis at the system, behavioral, register-transfer, and logic levels; application-specific processors; simulation; and emerging system-on-a-chip design methodologies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 222 Natural Language Processing 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): CS 171 or CS 172 or CS 173; CS 224 or CS 228 or CS 229; or equivalent.; graduate standing; or consent of instructor. Introduces Natural Language Processing (NLP), the study of computing systems that understand or communicate with human language. Covers both historical and contemporary NLP tasks and the fundamental methods of NLP "particularly deep learning-based approaches. " Topics include basic classification techniques, feedforward neural networks, attention mechanisms, and pre-trained neural models. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 223 Reconfigurable Computing 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): CS 202 or CS 203; consent of instructor. Covers reconfigurable computing, a novel computational model that is fast becoming part of the mainstream in high-performance computing. Addresses architectures, software tools and compilers, programming models, and applications. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 224 Foundations of Machine Learning 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 100; STAT 155 or EE 114; MATH 031; For the CS 224/EE 242A online section: enrollment in the Online

Master-in-Science in Engineering program; graduate standing.; graduate standing; or consent of instructor. A study of generative and discriminative approaches to machine learning. Topics include probabilistic model fitting, gradient-based loss optimization, regularization, hyper-parameters, and generalization. Includes experience with data science programming environments, data from practice, and performance metrics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 242A.

CS 225 Spatial Computing 4 Lecture, 3 hours; individualized study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduction to the spatial computing technologies and techniques. Covers the fundamentals, the present, and the emerging use cases of spatial data analysis systems. Topics include spatial data modelling, spatial relationships, storage, indexing, query processing, and recent trends in the field. Includes a research-oriented project and hands-on experience on spatial technologies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 226 Big-Data Management 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): CS 166 or CS 236; graduate standing. Introduction to the architecture and design of big data management systems. Covers the design of distributed file systems and high-throughput databases. Describes popular programming paradigms for big data including MapReduce and Resilient Distributed Datasets. Includes a course project with hands-on experience on open-source big data systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 227 Probabilistic Models For Artificial Intelligence 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): CS 224; graduate standing. Covers methods for representing and reasoning about probability distributions in complex domains. Focuses on graphical models and their extensions such as Bayesian networks, Markov networks, hidden Markov models, and dynamic Bayesian networks. Topics include algorithms for probabilistic inference, learning models from data, and decision making. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 228 Introduction to Deep Learning 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 224 or EE 231 or EE 236 or EE 244 or CS 171 or EE 142; graduate standing; or consent of instructor. Explores fundamentals of deep neural networks and their applications in various machine learning tasks. Includes the fundamentals of perception, approximation, neural network architectures, loss functions, and generalization. Addresses optimization methods including backpropagation, automatic differentiation, and regularization. Covers non-standard problems including auto-encoders and probabilistic models. Presents applications in machine learning/computer vision. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 228.

CS 229 Machine Learning 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 171 or EE 142 or CS 224 or EE 242A; For the CS 229/EE 242B online section; enrollment in the Online Master-in-Science in Engineering program; graduate standing; graduate standing. A study of supervised machine learning that emphasizes discriminative methods. Covers the areas of regression and classification. Topics include linear methods, instance-based learning, neural networks, kernel machines, and additive models. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 242B. Credit is awarded for one of the following CS 229, EE 242B, or EE 240.

CS 230 Computer Graphics 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 141 or CS 218; MATH 031 or MATH 131; graduate standing or consent of instructor. Covers advanced topics related to graphics and necessary fundamentals. Includes geometry representations; affine and perspective transforms; rendering with global illumination and other light models; shading and texture mapping; rasterization and anti-aliasing techniques; and hierarchical and keyframe animation. Also includes projects and/or in-depth programming assignments. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 231 Computer Animation 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 130 or CS 230; graduate standing. Covers topics in computer animation including motion capture, inverse kinematics, and dynamic simulation. Also examines deformable systems and other natural phenomena, facial animation, high-level behavior control, creature evolution, and procedural techniques. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 233 Pen-Based Computing 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor; computer programming experience Introduces computational techniques for pen-based user interfaces. Covers fundamental issues such as ink segmentation, sketch parsing, and shape recognition. Explores the topic of sketch understanding, including reasoning about context and correcting errors. Also addresses issues related to building practical pen-based systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with ME 231.

CS 234 Computational Methods For Biomolecular Data 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 111; CS 141 or CS 218; STAT 155 or STAT 160A; graduate standing. A study of computational and statistical methods aimed at automatically analyzing, clustering, and classifying biomolecular data. Includes combinatorial algorithms for pattern discovery; hidden Markov models for sequence analysis; analysis of expression data; and prediction of the three-dimensional structure of RNA and proteins. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following CS 234 or CS 144.

CS 235 Data Mining Techniques 4 Lecture, 3 hours; term paper, 1.5 hours; activity, 1.5 hours. Prerequisite(s): CS 141; CS 170 is recommended. CS 235 online section: enrollment in the online Master of Science in Engineering program; graduate standing. Provides a broad background in the design and use of data mining algorithms and tools. Includes clustering, classification, association rules mining, time series clustering, and Web mining. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 236 Database Management Systems 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 141; CS 166 recommended; graduate standing; or consent of instructor. Covers principles of file systems; architecture of database management systems; data models; and relational databases. Also examines logical and physical design of databases; hardware and software implementation of database systems; and distributed databases (e.g., query processing, concurrences, and recovery). May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 237 Advanced Topics in Modeling and Simulation 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 177; graduate standing. Covers formal computer simulation models such as Discrete Event Specified Models and differential equation models. Examines current developments in simulation languages. Also addresses integrated model development and its applications to complex, large-scale problems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 238 Algorithmic Techniques in Computational Biology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 141 or CS 218; graduate standing. A study of fundamental algorithms for solving combinatorial or computational problems in molecular biology and genomics. Includes sequence alignment and multiple alignment; bio-database search; gene and regulatory signal recognition; DNA sequence assembly; physical mapping; and reconstruction of evolutionary trees. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following CS 238 or CS 144.

CS 239 Performance Evaluation of Computer Networks 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 164; graduate standing. Offers models and analytical techniques for evaluating the performance of computer networks. Covers basic and intermediate queuing theory and queuing networks and their application to practical systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 240 Network Routing 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 141 or CS 204; CS 164; graduate standing. An in-

depth study of routing in computer networks. Examines general principles and specific routing protocols and technologies. Topics include Internet, Asynchronous Transfer Mode (ATM), optical, wireless, and ad hoc networks. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 241 Advanced Topics in Network Measurements and Security 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 164 or equivalent; graduate standing. Introduces measuring and building real network systems. Includes hands-on measurement studies and tools. Covers fundamental mathematical and statistical tools; exposure to implementation studies and techniques; principles of network architectures; and challenges in building testbeds and conducting measurements. Explores measurements and modeling of wireline, ad hoc, sensor, and cellular networks. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 8 units.

CS 242 Information Retrieval and Web Search 4 Lecture, 3 hours; term paper, 1.5, hours; project, 1.5 hours. Prerequisite(s): CS 141, CS 166. CS 242 online section: enrollment in the online Master of Science in Engineering program. Introduces Information Retrieval (IR) principles and techniques for indexing and searching document collections with special emphasis on Web search. Includes text processing, ranking algorithms, search in social networks, search evaluation, and search engines scalability. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 246 Software Verification 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 111, CS 141, CS 150; or equivalents; graduate standing; or consent of instructor. A study of advanced techniques to specify and examine the correctness of complex systems and software. Focuses on concurrent and distributed behavior, formal description languages, temporal logics, model checking and symbolic model checking, partial order reduction, and the use of verification tools. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 247 Principles of Distributed Computing 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 010C; graduate standing. Introduces the fundamental problems of distributed computing and the main algorithmic techniques used to solve these problems. Considers crashing processes and also malicious non-cooperating processes. Covers reliable broadcast, causal broadcast, total-order broadcast, distributed shared memory, consensus variants including blockchain consensus, atomic commit and terminating reliable broadcast, and replicated systems.

CS 248 Optimization For Machine Learning 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 229 or EE 231 or EE 244; graduate standing; or consent of instructor. Explores efficient optimization algorithms for machine learning. Emphasizes fundamental principles, provable guarantees, and contemporary results. Includes fundamentals of optimization (first-order methods, stochastic algorithms, accelerated schemes, non-convex optimization, regularization, and black-box optimization). Also covers connections to statistical learning (empirical risk minimization, finite-sample guarantees, and high-dimensional problems). May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 248.

CS 249 Advanced Program Analysis 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): CS 201, CS 206; restricted to major(s) ; graduate standing; or consent of instructor. Introduces the key concepts behind modern program analysis techniques focusing on static analysis. Topics include type inference, dataflow analysis, interprocedural analysis, control-flow analysis, and pointer analysis. Provides a foundation for applying program analysis in other domains or researching new analysis techniques. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 250 Software Security 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 255; graduate standing; or consent of instructor. Discusses concepts, theories, and techniques in software security from both defensive and offensive perspectives. Topics include vulnerability and exploitation, malware, patching and hardening, reverse engineering, and forensics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 251 Real-Time Embedded Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 120B or EE 120B; graduate standing. Covers fundamentals and principles of real-time embedded systems. Topics include uniprocessor and multiprocessor real-time scheduling, real-time operating systems, synchronization, resource reservation, memory management, and power management. Introduces mathematical techniques for real-time system analysis. Offers hands-on experience with designing, implementing, and evaluating real-time systems on embedded platforms. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 255.

CS 252A Data Analytics and Exploration 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 141, CS 100; STAT 155 or EE 114 or equivalent; graduate standing; or consent of instructor. Covers important algorithms relevant to the lifetime of data from data collection and cleaning to integration, data mining, and analytics. Topics include: sketch algorithms for computing statistics on data streams; mining social graphs including community detection and graph partitioning; Data Science life cycle: techniques on data cleaning, data integration, Exploratory Data Analysis, and visualization. Cross-listed with EE 251A.

CS 252B Fundamentals of Data Science 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): MATH 010A, MATH 031 or EE 020B; CS 100; STAT 155 or EE 114; graduate standing; or consent of instructor. Explores theoretical tools in data science and their applications in data science. Introduces and motivates statistical and computational viewpoints on data analysis. Topics include the manipulation of data as vectors, drawing inferences from data as distributions, and quantifying data uncertainty for data analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 251B.

CS 253 Distributed Systems 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 153; graduate standing. Integrates the theory and practice of distributed systems with a focus on recent developments in distributed systems. Includes middleware architectures; distributed process management and real-time scheduling; dependability; and group communication protocols. Also covers distributed process management; replication; large-scale peer-to-peer systems; Internet content delivery; and Web caching. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 254 Network Security 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 165. Introduces the security problems in the networking domain, attacks and defenses, vulnerabilities in various network protocols. Topics include protocol security of DNS, TCP/IP, SSL/TLS, applied cryptography, network side channel attacks, firewalls, censorship technology, internet measurement. Guides students to conduct small-scale research projects. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable.

CS 255 Computer Security 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 153 or CS 164 or CS 165; graduate standing. Discusses the theoretical and practical issues arising in the context of computer systems security and the principles underlying the design of secure computing environments. Topics include cryptography, security models, authentication protocols, network security, intrusion detection, attacks and their countermeasures, and secure systems design. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 256 Distributed Computing in Cyber-Physical Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Covers theoretical foundations of distributed computing including logical clocks, message delivery, and mutual exclusion, with applications to cyber-physical systems such as autonomous vehicles and robotics. Topics include distributed coordination, resilience, and emerging techniques like LLM-driven communication in CPS, bridging theory, and practical applications. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 258.

CS 257 Wireless Networks and Mobile Computing 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 141; CS 164 or CS 204; graduate standing. Introduces basic and advanced concepts of wireless networks and mobile computing. Covers both wireless cellular and ad hoc networks. Includes protocols for medium access control, resource allocation, and routing, as well as transport layer optimizations for the wireless environment. Also covers standards, Bluetooth, and the IEEE 802.11 for wireless local area networks. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CS 258 Introduction to Reinforcement Learning 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 215 or EE 244 or CS 224 or EE 228 or CS 228 or EE 251B or CS 252B; graduate standing; or consent of instructor. This course introduces key ideas and algorithms of reinforcement learning (RL). Key topics covered include finite Markov Decision Process (MDP), dynamic programming, Monte Carlo methods, temporal-difference learning, policy gradient methods, safety-constrained RL, batch-constrained RL, multi-agent RL, multi-armed bandits, and imitation learning. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 227.

CS 260 Seminar in Computer Science 4 Seminar, 4 hours. Prerequisite(s): graduate standing; consent of instructor. Covers current research topics in computer science. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 8 units.

CS 265A Foundations of Robotics: Planning and Control 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Provides a theoretical and practical introduction to fundamental concepts used for the development of robotic systems. Covers robot kinematics; motion planning algorithms; robot motion control; and state estimation. Uses mobile robots to teach contemporary robotics software (ROS, Gazebo) that integrates the taught concepts to develop autonomous robot applications. Cross-listed with EE 265A.

CS 265B Foundations of Robotics: Sensing and Navigation 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): EE 245A; CS 224 or EE 242A; graduate standing; or consent of instructor. Covers fundamental topics for robot perception. Provides a theoretical and practical introduction to SLAM. Discusses related advanced topics on robot sensing and navigation. Teaches the mechanisms that allow autonomous robots to move through a real-world environment to perform their tasks. Cross-listed with EE 265B.

CS 270 Special Topics in Advanced Computer Science 2 Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Involves presentations and discussions by faculty and students that focus on new research in computer science. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CS 277 Data Centric Computer Architecture 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 161; graduate standing; or consent of instructor. Addresses the rapid growth of dataset size and the introduction of hardware accelerators, resulting in the data movement overhead becoming the major performance bottleneck. Includes system interconnects, I/O stacks, emerging nonvolatile memory technologies, near-data processing, and data flow architectures. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 277.

CS 279 Capstone Project in Data Science 4 Lecture, 1 hour; research, 6 hours; extra reading, 3 hours. Prerequisite(s): CS 252A or EE 251A; CS 252B or EE 251B; graduate standing; or consent of instructor. Covers technical, analytic, and interpretive skills to design and execute a large-scale data science capstone project focusing on real-world applications. Provides an opportunity to integrate all of the core skills and concepts learned throughout the program. Prepares for long-term professional success in the field. Cross-listed with EE 279.

CS 287 Colloquium in Computer Science 1 Colloquium, 1 hour. Prerequisite(s): graduate standing. Lecture on current research topics in computer science and topics relating to professional development presented by faculty members and visitors. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CS 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Special studies in computer science. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

CS 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Directed research on selected projects in computer science under the sponsorship of assigned faculty members. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CS 298I Individual Internship 1 to 12 Written Work, 1 to 12 hours; internship, 2 to 24 hours. Prerequisite(s): graduate standing; consent of instructor. Individual apprenticeship in computer science. Includes fieldwork with an approved professional individual or organization and academic work under the direction of a faculty member. A final written report is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

CS 299 Research For Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing and consent of instructor. Research in computer science under the direction of a faculty member. To be included as part of the thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

CS 302 Apprentice Teaching 1 Activity, 3 hours. Prerequisite(s): enrollment limited to teaching assistants and associates in Computer Science Supervised teaching in upper- and lower-division Computer Science courses; graduate standing. Aids in the learning of effective teaching methods such as the handling of Computer Science discussion sections, preparation and grading of examinations, and student relations. Required each quarter of all Computer Science teaching assistants and associates. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

Conservation Biology

Subject abbreviation: BLCN
College of Natural and Agricultural Sciences

Program Office, 1223 Pierce Hall
(951) 827-7294; ccb.ucr.edu

The major in Conservation Biology is not currently accepting new students. Students who are interested in this field should see the academic advisors at the CNAS Undergraduate Academic Advising Office, (951) 827-7294.

Upper-Division Courses

BLCN 190 Special Studies 1 to 4 Individual Study, 3 to 12 hours. Prerequisite(s): consent of instructor and Program Chair. To be taken as a means of meeting special curricular needs. Course content, style, requirements, and grading basis is selected in consultation with the instructor and Program Chair. Course is repeatable to a maximum of 12 units.

BLCN 197 Research For Undergraduates 1 to 2 Research, 3 to 6 hours. Prerequisite(s): sophomore, junior, or senior standing in Conservation Biology; consent of instructor and Program Chair. An introduction to research providing the opportunity, through reading and preliminary laboratory work, to develop a research project suitable for BLCN 199. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.

BLCN 198I Individual Internship in Conservation Biology 2 to 4 Internship, 6 to 12 hours; consultation, 1 hour; outside reading, 2 to 4 hours. Prerequisite(s): upper-division standing in Conservation Biology An off-campus practical experience in the public or private sector related to conservation biology that is conducted under the joint supervision of an off-campus sponsor and a faculty mentor from the Conservation Biology Program. A written report on the internship is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

BLCN 199 Senior Research 1 to 4 Laboratory, 3 to 12 hours. Prerequisite(s): junior or senior standing in Conservation Biology; consent of instructor and Program Chair. BLCN 197 is recommended. Research in conservation biology performed under the supervision of a faculty member in the

Conservation Biology Program. A written research report is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

Corporeality and Embodiment Designated Emphasis

College of Humanities, Arts, and Social Sciences

Directors:
Iván Aguirre (Hispanic Studies)
Anthea Kraut (Dance)

Oversight Committee:
Iván Aguirre (Hispanic Studies)
Crystal Baik (Gender and Sexuality Studies)
Jennifer Doyle (English)
Anthea Kraut (Dance)
Liz Przybylski (Music)
Judith Rodenbeck (Media and Cultural Studies)

Affiliated Faculty:
Maria Firmino-Castillo (Dance)
Andrea Denny-Brown (English)
Imani Johnson (Dance and Black Study)
Tamara Ho (Gender and Sexuality Studies)
Jose Reynoso (Dance)
Joel Mejia Smith (Dance)
Chikako Takeshita (Gender and Sexuality Studies)
James Tobias (English)

Designated Emphasis Requirements

The Designated Emphasis in Corporeality and Embodiment is a 12-unit course of study requiring two graduate-level seminars across two departments and 4 units of 297 course-work, during which, under the guidance of a faculty mentor, students complete a research project that focuses on some aspect of corpo-reality and/or embodiment. Courses used for the Designated Emphasis cannot be counted toward a student's masters or Ph.D. requirements; they must be in addition.

1. **Two (2) graduate-level courses (8 units) selected from:**

   ANTH 261; DNCE 239-244; DNCE 254; DNCE 255; DNCE 257; DNCE 258; DNCE 260; DNCE 264; DNCE 267; ENGL 272; ENGL 277; MUS 254; SPN 276

   Or any of of the following courses, combined with 2 units of 292 concurrent enrollment:

   ENGL 122 (E-Z); ENGL 141I; ENGL 141Z; GSST 106; GSST 130; GSST 154; GSST 183; GSST 185; GSST 189; GSST 191A; MCS 106; MCS 117; MCS 153E-Z

   Students may ask to count another course with relevant content as approved by the Designated Emphasis Director. 100-level undergraduate courses taken to fulfill these requirements must be accompanied by a 2-unit 292 "concurrent enrollment" course with extra work mutually agreed upon by professor and student.

2. **4 units of 297 taken with a faculty mentor over one or two quarters and completion of a research project, papers for which should be 25-30 pages in length and of publishable quality.**

All requirements for the Designated Emphasis must be completed no later than one calendar year from the end of the quarter in which students advance to candidacy.

Students are required to complete courses within the Designated Emphasis with a minimum of a 3.0 GPA.

Creative Writing

Subject abbreviation: CRWT
College of Humanities, Arts, and Social Sciences

Steve Erickson, M.A., Chair
Department Office, INTN 3002
(951) 827-5421; creativewriting.ucr.edu

Professors
Reza Aslan, Ph.D.
Charmaine Craig, M.F.A.
Josh Emmons, M.F.A
Alex Espinoza, M.F.A.
Katie Ford, M.F.A.
Emily Rapp Black, M.F.A.
Allison Benis White, M.F.A.

Distinguished Professors
Steve Erickson, M.A.
Allison Hedge Coke, M.F.A
Laila Lalami, Ph.D.
Susan C. Straight, M.F.A.

Professors Emeriti
Juan Felipe Herrera, M.F.A.
Maurya Simon, M.F.A.
Tom Lutz, Ph.D.

Associate Professors
Michael Jayme, M.F.A.
Goldberry Long, M.F.A.
Andrew Winer, M.F.A.

**

Lecturers
Rachelle Cruz, M.F.A.
Joshua Hardina, M.F.A.
Brandon Williams, M.F.A.

Major

The Creative Writing major offers a series of workshop courses in poetry, fiction, and nonfiction as well as reading courses in poetry, fiction, and nonfiction presented from a writer's point of view. They are taught for the most part by poets, fiction and nonfiction writers

The writing courses are taught as workshops, so that the subject matter (the students' stories and poems) is different each time the course is offered

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The major requirements for the B.A. degree in Creative Writing are as follows:

Prerequisite courses: CRWT 056 or equivalent, and ENGL 001A or equivalent.

1. **Lower-division requirements (20 units; five courses)**

   Two Creative Writing survey courses from CRWT 046S, CRWT 047S, or CRWT 048S, CRWT 046, CRWT 047 or CRWT 048

   and

   Two Creative Writing introductory courses from CRWT 057A, CRWT 057B, or CRWT 057C

   and

   One literature survey course from CRWT 012/CPLT 012, CRWT 040 or CRWT 040S, CRWT 041, CRWT 042, CRWT 043, CRWT 044, CRWT 045, CRWT 076, ENGL 014, ENGL 017, CRWT 097H

2. **Upper-division requirements (36 units)**

   a) Three workshop courses in primary genre:

   Creative Nonfiction
   CRWT 130, CRWT 132, CRWT 134

   or

   Poetry
   CRWT 150, CRWT 160, CRWT 170

   or

   Fiction
   CRWT 152, CRWT 162, CRWT 172

   b) One workshop in second genre: CRWT 130, CRWT 132, CRWT 134, CRWT 150, CRWT 152, CRWT 160, CRWT 162*, CRWT 170*, CRWT 172*

   *These workshops may be repeated; however, only 4 units total can be applied to the major.

   c) One workshop in third genre: CRWT 130, CRWT 132, CRWT 134, CRWT 150, CRWT 152, CRWT 160, CRWT 162*, CRWT 170*, CRWT 172*

   *These workshops may be repeated; however, only 4 units total can be applied to the major.

   d) Three upper-division courses in Creative Writing: CRWT 136, CRWT 143, CRWT 146, CRWT 151, CRWT 155, CRWT 164A/TFDP 164A, CRWT 164B/TFDP 164B, CRWT 164C/TFDP 164C, CRWT 165, CRWT 171, CRWT 173, CRWT 174, CRWT 175, CRWT 176, CRWT 180, CRWT 182, CRWT 185, CRWT 187/CPLT 187, CRWT 191 (may be taken twice but used only once for major credit), CRWT 198I (may be taken only once, for 4 units)

   e) Four (4) units of CRWT 195 or CRWT 195H (Senior Honors Thesis) or any upper division course in another subject area outside of Creative Writing

Minor

1. **Lower-division requirements (12 units)**

   a) One introductory writing workshop: CRWT 056

   b) One introductory reading course: CRWT 040 or CRWT 040S, CRWT 043, CRWT 046S, CRWT 047S,CRWT 048S, CRWT 046, CRWT 047, or CRWT 048.

   c) Two introductory workshop courses from CRWT 057, CRWT 057B, CRWT 057C.

2. **Upper-division requirements (20 units)**

a) Four (4) units from

(1) CRWT 176 (or)

(2) Any upper-division course in English, Comparative Literature and Foreign Languages, or Theatre (except ENGL 101, ENGL 103; FREN 100, FREN 101A, FREN 101B, FREN 101C; GER 101, GER 103A, GER 103B; RUSN 103; SPN 101A, SPN 101B, SPN 101C, SPN 105, SPN 106A, SPN 106B)

b) Sixteen (16) units in one of the following emphases:

Nonfiction Emphasis

(1) CRWT 130, CRWT 132, CRWT 134

(2) Four (4) units from CRWT 150, CRWT 152, CRWT 164A/THEA 164A, CRWT 165, CRWT 166A/MCS 166A/TFDP 166A, CRWT 171, CRWT 187/CPLT 187

Poetry Emphasis

(1) CRWT 150, CRWT 160, CRWT 170

(2) Four (4) units from CRWT 130, CRWT 152, CRWT 164A/THEA 164A, CRWT 165, CRWT 166A/MCS 166A/TFDP 166A, CRWT 171, CRWT 187/CPLT 187

Fiction Emphasis

(1) CRWT 152, CRWT 162, CRWT 172

(2) Four (4) units from CRWT 130, CRWT 150, CRWT 164A/THEA 164A, CRWT 165, CRWT 166A/MCS 166A/TFDP 166A, CRWT 187/CPLT 187

Drama Emphasis

(1) CRWT 164A/TFDP 164A, CRWT 164B/TFDP 164B, CRWT 164C/TFDP 164C

(2) Four (4) units from CRWT 130, CRWT 150, CRWT 152, CRWT 165, CRWT 166A/MCS 166A/TFDP 166A, CRWT 166B/MCS 166B/TFDP166B, CRWT 166C/MCS 166C/TFDP 166C, CRWT 187/CPLT 187, TFDP 121

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors. See also Journalism minor.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Graduate Program

See Creative Writing and Writing for the Performing Arts in this catalog for more information on the M.F.A. in this area.

Lower-Division Courses

CRWT 012 The Writer in Writing 4 Lecture, 3 hours; written work, 2 hours; research, 1 hour. Prerequisite(s): none. Targeted at the fledgling creative writer and apprentice literary critic, surveys the complex legacy surrounding the figure of the writer in world literature. Discussion and weekly writing exercises demonstrate the use of brainstorming in creating and critiquing literature. Cross-listed with CPLT 012.

CRWT 040 Fiction and Film 4 Lecture, 3 hours; screening, 3 hours; written work, 1 hour. Prerequisite(s): none. A study of twentieth-century fiction and film from the writer's point of view. Emphasizes narrative elements and literary techniques found in both forms. Explores how novels are translated into film. Credit is awarded for one of the following CRWT 040 or CRWT 040S.

CRWT 040S Fiction and Film 5 Lecture, 3 hours; discussion, 1 hour; screening, 3 hours; written work, 1 hour. Prerequisite(s): none. A study of twentieth-century fiction and film from the writer's point of view. Emphasizes narrative elements and literary techniques found in both forms. Explores how novels are translated into film. Credit is awarded for one of the following CRWT 040S or CRWT 040.

CRWT 041 Poetry and Fiction: A Reading Course For Writers 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): none. Analytical reading of contemporary poetry and fiction in order to broaden and deepen students' understanding of the craft of writing. Students analyze and practice poetic and fictional techniques.

CRWT 044 Ghosts, Gods, and Monsters: Children's Literature For Writers 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A survey of children's literature, with emphasis on how the craft of tales and fables contributes to their meaning. Explores techniques the beginning writer can learn from children's literature.

CRWT 045 The Prose Poem and "Short-Short" Story 4 Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): none. Explores what distinguishes prose poems from "sudden" or "short-short" fiction. Investigates the use of narrative and figurative language and the tapping of the unconscious mind.

CRWT 046 Craft of Writing: Survey in Contemporary Fiction 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A survey of selected works of contemporary fiction and related texts. Emphasizes the craft of fiction and how craft contributes to meaning. Course is repeatable as content or topic changes to a maximum of 8 units. Credit is not awarded for CRWT 046S if it has already been awarded to CRWT 046 if the content or topic is the same.

CRWT 046S Craft of Writing: Survey in Contemporary Fiction 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A survey of selected works of contemporary fiction and related texts. Emphasizes on the craft of fiction and how craft contributes to meaning. Course is repeatable as content changes to a maximum of 8 units. Credit is not awarded for CRWT 046S if it has already been awarded to CRWT 046 if the content or topic is the same.

CRWT 047 Craft of Writing: Survey in Contemporary Poetry 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A survey of selected works of contemporary poetry and related texts. Emphasizes the craft of poetry and how craft contributes to meaning. Course is repeatable as content or topic changes to a maximum of 8 units. Credit is not awarded for CRWT 047 if it has already been awarded to CRWT 047S if the content or topic is the same.

CRWT 047S Craft of Writing: Survey in Contemporary Poetry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A survey of selected works of contemporary poetry and related texts. Emphasizes the craft of poetry and how craft contributes to meaning. Course is repeatable as content or topic changes to a maximum of 8 units. Credit is not awarded for CRWT 047S if it has already been awarded to CRWT 047 if the content or topic is the same.

CRWT 048 Craft of Writing: Survey in Contemporary Nonfiction 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A survey of selected works of contemporary nonfiction and related texts. Emphasizes the craft of nonfiction and how craft contributes to meaning. Course is repeatable as content or topic changes to a maximum of 8 units. Credit is awarded for one of the following CRWT 048 or CRWT 048S with the same content or topic.

CRWT 048S Craft of Writing: Survey in Contemporary Nonfiction 5 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): none. A survey of selected works of contemporary nonfiction and related texts. Emphasizes the craft of nonfiction and how craft contributes to meaning. Course is repeatable as content or topic changes to a maximum of 10 units. Credit is awarded for only one of CRWT 048 or CRWT 048S with the same content/topic.

CRWT 056 Introduction to Creative Writing 4 Lecture, 3 hour; discussion, 1 hour. An introduction to the craft of creative writing. Focuses on the elements of a number of genres, including poetry, fiction, nonfiction, journalism, drama, and the graphic novel.

CRWT 057A Introduction to Fiction 4 Workshop, 3 hours; written work, 3 hours. Prerequisite(s): CRWT 056; ENGL 001A with a grade of C or better. Introduction to the elements and the craft of fiction. Credit is awarded for one of the following CRWT 057A or CRWT 057SA.

CRWT 057B Introduction to Poetry 4 Workshop, 3 hours; written work, 3 hours. Prerequisite(s): CRWT 056 ENGL 001A. Introduction to the elements and craft of poetry.

CRWT 057C Introduction to Creative Nonfiction 4 Workshop, 3 hours; written work, 3 hours. Prerequisite(s): CRWT 056, ENGL 001A. Introduction to the elements and craft of nonfiction.

CRWT 057SA Introduction to Fiction 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): CRWT 056, ENGL 001A with a grade of C or better. Introduction to the elements and the craft of fiction. Credit is awarded for one of the following CRWT 057SA or CRWT 057A.

CRWT 066 Screenwriting: How Movies Work 4 Lecture, 3 hours; discussion, 1 hour; screening, 8 hours per quarter. Prerequisite(s): none. An Introduction to writing for stage and screen. Addresses structure, character, dialogue, theme, and story. Cross-listed with MCS 066, and TFDP 066.

CRWT 076 The Verbal Coliseum: Spoken Word Workshop 5 Workshop, 3 hours; discussion, 1 hour; written work, 1 hour; extra reading, 2 hours. Explores forms and issues in contemporary spoken word poetics, including performance and writing, multimedia and audience, community relations, media culture and power, music and art, and cultural production. Course is repeatable to a maximum of 8 units.

Upper-Division Courses

CRWT 132 Intermediate Creative Nonfiction 4 Workshop, 3 hours; research, 3 hours. Prerequisite(s): CRWT 056. Reviews the essential strategies for writing and critically evaluating creative nonfiction essays. Focuses primarily on memoir, personal experience, and nature and science writing. Course is repeatable to a maximum of 8 units.

CRWT 134 Advanced Creative Nonfiction 4 Workshop, 3 hours; research, 3 hours. Prerequisite(s): CRWT 056; CRWT 132. Explores strategies for writing and critical evaluating creative nonfiction essays. Focuses primarily on memoir, autobiography, history, and interview writing and how to work toward a sequence of longer work of nonfiction in that mode, as well as the "fact" or "immersion" essay. Course is repeatable to a maximum of 8 units.

CRWT 146 Special Topics: Fiction 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): CRWT 056; or consent of instructor. Explores specific topics of style and craft in fiction. Course is repeatable as content or topic changes to a maximum of 8 units. Credit is awarded to a maximum of 10 units for either or both CRWT 146 or CRWT 146S with different titles.

CRWT 146S Special Topics: Fiction 5 Seminar, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): CRWT 056; or consent of instructor. Explores specific topics of style and craft in fiction. Course is repeatable as content or topic changes to a maximum of 10 units. Credit is awarded to a maximum of 10 units for either or both CRWT 146 or CRWT 146S with different titles.

CRWT 155 The Graphic Novel 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): CRWT 046 or CRWT 046S or CRWT 047 or CRWT 047S or CRWT 048 or CRWT 048S; CRWT 056; or consent of instructor. Explores the chronological development of the graphic novel. Focuses on theme, style, and artistic presentation. Course is repeatable as content or topic changes to a maximum of 8 units.

CRWT 160 Intermediate Poetry Workshop 4 Workshop, 3 hours; research, 3 hours. Prerequisite(s): CRWT 056. Students produce and bring to class for analysis and commentary, a large quantity of original work in poetry. Course is repeatable to a maximum of 8 units.

CRWT 162 Intermediate Fiction Workshop 4 Workshop, 3 hours; research, 3 hours. Prerequisite(s): CRWT 056. Provides intensive analysis of original works of fiction. Course is repeatable to a maximum of 8 units.

CRWT 164A Beginning Playwriting 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): CRWT 056 or TFDP 100 or consent of instructor. Seminar in the practice of playwriting centering on the construction of a plot. Cross-listed with TFDP 164A.

CRWT 164B Intermediate Playwriting 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): CRWT 164A/TFDP 164A. Seminar in the practice of playwriting. Revisions of works in progress emphasizing character development and techniques for writing dialogue. Cross-listed with TFDP 164B.

CRWT 164C Advanced Playwriting 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): CRWT 164B/TFDP 164B. Seminar in the practice of playwriting. Includes playwrights' participation in staged readings of their work. With consent of instructor, course is repeatable to a maximum of 8 units. Cross-listed with TFDP 164C.

CRWT 170 Advanced Poetry Workshop 4 Workshop, 3 hours; research, 3 hours. Prerequisite(s): CRWT 056; CRWT 160. A workshop in poetry writing for students who wish to attempt, with criticism from class members, to fashion a significant long poem or group of poems. Course is repeatable as content or topic changes.

CRWT 171 Anatomy of Poetry 4 Lecture, 3 hours; creative writing, 3 hours. Prerequisite(s): CRWT 160 or consent of instructor. An introductory study of poetics, including traditional and contemporary forms. Students write in the various poetic forms studied.

CRWT 172 Advanced Fiction Workshop 4 Workshop, 3 hours; research, 3 hours. Prerequisite(s): CRWT 056; CRWT 162. Provides guidance in fashioning a collection of stories or a novel. Includes opportunities for peer review and criticism. Course is repeatable as content or topic changes.

CRWT 173 Prose Poem Workshop 4 Workshop, 3 hours; written work, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores contemporary prose poetry. Studies the history of contemporary essays that define the mechanics and parameters of the prose poem. Requires substantial writing and critiquing. Course is repeatable as content changes to a maximum of 8 units.

CRWT 176 Topics in Craft of Writing 4 Lecture, 3 hours; extra reading, 1 hour; practice writing, 2 to 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers the formal study and practice of the craft of writing, its technical aspects, and development through the contemporary period in the genres of poetry, fiction, and non-fiction. Course is repeatable as content changes to a maximum of 12 units.

CRWT 182 Professional Fiction Workshop 5 Workshop, 3 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): CRWT 056; CRWT 162; CRWT 172. Provides study of fiction writing at the graduate and professional level. Focuses on producing and polishing work and discusses the professional aspect of writing such as submission and publication.

CRWT 185 Special Topics in Nonfiction 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores specific topics in non-fiction. Course is repeatable as content changes to a maximum of 8 units.

CRWT 186A Beginning Book Arts 4 Lecture, 1 hour; consultation, 1 hour; laboratory, 6 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the elements of press operation. Using traditional letterpresses, students learn hands-on typesetting, design, material and text selection, editing, printing, and binding skills, as well as the history of the book and book design.

CRWT 186B Intermediate Book Arts 4 Workshop, 1 hour; consultation, 1 hour; laboratory, 6 hours. Prerequisite(s): CRWT 186A; upper-division standing or consent of instructor. An expanded discussion of the techniques and styles in press operation. Students build on the techniques acquired in CRWT 186A and demonstrate finished projects.

CRWT 187 Metafiction 4 Lecture, 3 hours; creative writing, take-home midterm, or term paper, 30 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Covers postmodernism, metafiction, and the new novel in Europe and America. Creative writers submit fiction in lieu of a term paper or midterm. Cross-listed with CPLT 187.

CRWT 190 Special Studies 1 to 5 Prerequisite(s): To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable to a maximum of 16 units.

CRWT 195 Senior Thesis 4 Consultation, 1 hour; thesis, 3 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): consent of department chair. Creation of a significant piece of work under faculty supervision. Project composed in the genres of poetry, fiction, or nonfiction.

CRWT 195H Senior Honors Thesis 4 Consultation, 1 hour; research, 4 hours; extra reading,3 hours; thesis, 4 hours. Prerequisite(s): consent of Department Chair The student works independently with a faculty member to prepare a project. For the Creative Writing major, the project may be a group of poems, a long poem, a group of short stories, a novel, or a part of a novel. For the Journalism minor, the project may be a news feature, an investigative article, or a similar story requiring significant endeavor in reporting and writing and demonstrating an understanding of sound journalistic technique.

CRWT 198I Individual Internship 1 to 12 Field, 2 hours per unit, Prerequisite(s): consent of instructor; upper-division standing. Work with an appropriate professional individual or organization to gain experience and skills in any form of writing which meets with the approval of the Creative Writing Chair (e.g., journalism, radio journalism). Letter grading or Satisfactory (S)/No Credit (NC). Course is repeatable to a maximum of 16 units.

Creative Writing and Writing for the Performing Arts

Subject Abbreviation: CWPA, CWLR
College of Humanities, Arts, and Social Sciences

Main Campus Traditional M.F.A
Stu Krieger, B.A., Advisor
(Theatre, Film, and Digital Production)
Reza Aslan, Ph.D., Advisor (Creative Writing)
Program Office, ARTS 124
(951) 827-5568
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Main Campus Traditional M.F.A Faculty

Professors
Reza Aslan, Ph.D. (Creative Writing)
Steve Erickson, M.A. (Creative Writing)
Charles Evered, M.F.A. (Theatre, Film and Digital Production)
Katie Ford, M.F.A., M.Div. (Creative Writing)
Allison Hedge Coke, M.F.A.(Creative Writing)
Rickerby Hinds, M.F.A. (Theatre, Film and Digital Production)
Erith Jaffe-Berg, Ph.D. (Theatre, Film and Digital Production)
Stuart Krieger, B.A. (Theatre, Film and Digital Production)
Laila Lalami, Ph.D. (Creative Writing)
Tom Lutz, Ph.D. (Creative Writing)
Robin Russin, M.F.A. (Theatre, Film and Digital Production)
Susan C. Straight, M.F.A. (Creative Writing)

Professors Emeriti
Mike Davis, C.Phil. (Creative Writing)
Juan Felipe Herrera, M.F.A. (Creative Writing)
Mark Haskell Smith, M.F.A. (Creative Writing)

Associate Professors
Josh Emmons, M.F.A. (Creative Writing)
Donatella Galella, Ph.D. (Theatre, Film, and Digital Production)
Michael Jayme, M.F.A. (Creative Writing)
Keun-Pyo "Root" Park, M.F.A. (Theatre, Film and Digital Production)
Andrew Winer, M.F.A. (Creative Writing)
Allison Benis White, M.F.A. (Creative Writing)
Charmaine Craig, M.F.A. (Creative Writing)
Emily Rapp Black, M.F.A. (Creative Writing)

Palm Desert Low Residency M.F.A.
Tod Goldberg, M.F.A., Administrative Director (760) 834-0928
Kathryn McGee, Program Manager (760) 834-0939
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Low Residency M.F.A. Core Faculty
Michael Birnbaum, M.F.A. (Screenwriting)
Elizabeth Crane-Brandt, B.A. (Creative Writing)
Gabino Iglesias, Ph.D. (Creative Writing)
Ivy Pochoda, M.F.A. (Creative Writing)
Jill Alexander Essbaum, M.A., M.A.R. (Creative Writing)
Tod Goldberg, M.F.A. (Creative Writing)
Joshua Malkin, M.F.A. (Screenwriting)
William Rabkin, B.A. (Creative Writing)
Robert Roberge, M.F.A. (Creative Writing)
John Schimmel, M.F.A. (Screenwriting)
David Ulin, B.A. (Creative Writing)

Graduate Program

Master of Fine Arts

The Master of Fine Arts (M.F.A.) degree in Creative Writing and Writing for the Performing Arts (CWPA) offers writers the ability to move fluidly within various arenas of creative writing, including the genres of poetry, fiction, nonfiction, playwriting, and screenwriting, as well as in multimedia studies. The program integrates scholarly studies of narrative, style, voice, structure, and history of these writing disciplines with traditional workshop formats, forming writers who can actively direct the literature of the 21st century.

For students in the Main Campus
Traditional M.F.A. program, financial assistance may include teaching assistantships and fellowships, as well as fellowships for community projects through the Gluck Fellows Program of the Arts.

UCR Palm Desert Center (PDC)
The Low Residency MFA in Creative Writing & Writing for the Performing Arts is offered through UCR's Palm Desert Center. Students in the Low Residency program receive financial assistance through a series of robust scholarships, grants, and awards, and editorial positions on the Coachella Review.

Palm Desert Low Residency Program
Students enroll in a prescribed number of units each term. Requirements are similar to the full-time program at UC Riverside, but courses are modified to fit low residency requirements. Low Residency MFA students come to Rancho Mirage, California for two ten-day sessions in the Fall and Spring quarters that include lectures, seminars, workshops and readings (please refer to website palmdesertmfa.ucr.edu for specific dates). Students also attend a final thesis or manuscript residency their last quarter to file. Students also enroll in a one unit Professional Development Course during this quarter. During the rest of the academic year, students participate in online workshops and seminars and work individually with faculty. Cross-enrollment between programs is not allowed. Full time enrollment in this program is 8 units per quarter for 7 quarters, and students pay a per unit fee.

Admission
Applicants to either program should demonstrate significant professional skill by submitting in thesis or manuscript form one of the following: 10-15 pages of poetry, a maximum of 25 pages of fiction or nonfiction, or the first act or a maximum of 25 pages of a screen play or play. Applicants must have a B.A. or B.S. degree from an accredited institution and submit 3 letters of recommendation, a self-statement, and original transcripts. Applications for the Main Campus Traditional Program are accepted for Fall quarter only; applications for the Palm Desert Low Residency program are accepted for the Fall and Spring quarters.

Plan I (Thesis or Manuscript) Both M.F.A. programs (Main Campus and PDGC Low Residency) require completion of a thesis or manuscript, the requirements of which are the same. Each student will decide which title - thesis or manuscript - best suits their work.

Main Campus Traditional Program

Consists of workshops in chosen genres, culminating in a final project (the master's thesis or manuscript) that showcases the writer's cultivated talents, in the form of a poetry collection, novel, memoir, screenplay, or full-length play. The M.F.A. requires students to major in one genre but encourages them to explore the other genres as well, allowing for creative movement within disciplines. Structure and focus in screenwriting and playwriting can also be applied to fiction and nonfiction, and lyricism and metaphor in poetry can also enhance description and dialogue in the other genres, for example. Students can also engage in course work in varied areas of directing and acting, in film history and literature, in literary criticism and translation, with supplemental courses selected from departments such as Comparative Literature and Foreign Languages, English, Hispanic Studies, and Media and Cultural Studies. Students can gain practical aspects of filmmaking from courses in Studio Art and Theatre.

Course Requirements
Minimum requirements consist of 56 units of course work (14 courses) and 8 units of master's thesis or manuscript project. The core curriculum includes the following:

1. Students in the Creative Writing Track (fiction, nonfiction and poetry) are required to take six workshop courses in their chosen genre. (24 units total). Students in the Writing for Performing Arts Track (playwriting and screenwriting) are required to take five workshop courses in their chosen genre (20 units). Requisite courses include CWPA 230 for nonfiction concentration; CWPA 262 for fiction concentration; CWPA 270 for poetry concentration; CWPA 264, 266, 267, 268 or 269 for playwriting and screenwriting concentration.
2. Three graduate seminars from Creative Writing and Writing for the Performing Arts (12 units). Students may select from the following: CWPA 200, 210, 214, 227, 231, 246, 250, 251, 252E, 252F, 252G, 2521, 252J, 252K, 253, 255, 256, 257, 260, 265A,265B,275,276, 277,278,279,281, 282,285
3. One graduate seminar from any department outside of Theatre and Creative Writing. Seminar subject matter should be relevant to student's thesis or manuscript project. Requirement can be met with upper-division courses, with instructor and graduate advisor approval, as an appropriate 292 course (1 units).

4. Creative Writing track students will take four (16 units) electives and Writing for the Performing Arts track students will take five (20 units) electives in workshop, graduate seminar or thesis or manuscript, with the following limitations: Students may take a maximum of six workshops (24 units) within their chosen genre, and a maximum of 16 thesis or manuscript units within the normative time to degree (six terms). Students are encouraged to take seminars or cross-genre workshops, as available; elective thesis or manuscript units beyond the 8 required units must be approved by the student's thesis or manuscript advisor and graduate advisor. Students may select from CWPA 200, 210, 214,227,230,231,246,250, 252E, 252F, 252G, 2521, 252J, 252K, 253, 255, 256, 257,260,262, 264,265A, 265B,266,267, 268, 269, 270, 275, 276, 277, 278, 279, 281, 282, 283, 284, 285, 288, 299 or seminars from departments outside of Theatre, Film, and Digital Production and Creative Writing.
5. Thesis or manuscript (8 units) In the areas of playwriting and screenwriting, the final written project is a full-length play of two or three acts (90-130 pages) or screenplay or teleplay (approximately 130 pages). In the areas of poetry, fiction, and nonfiction, the final written project Is a poetry collection, novel, short story collection, or essay collection. Each student is paired with one or two faculty members who serve as thesis advisor(s). Two faculty readers, in addition to the advisor(s), evaluate the thesis work. The length of the final project breaks down as follows: Poetry 40-65 pages, Fiction 100-150 pages, Creative Non-fiction 100-150 pages, screenplay, teleplay or play 90-130 pages.

Normative Time to Degree Main campus: 6 quarters

Professional Development Requirement
By completing the required workshops in their chosen genre, as well as thesis research units in CWPA 299, students will fulfill professional development training by the end of their 6th quarter. Requisite courses include CWPA 230 for nonfiction concentration; CWPA 262 for fiction concentration; CWPA 270 for poetry concentration: CWPA 264, 266, 267, 268 or 269 for playwriting and screenwriting concentration.

Palm Desert Low Residency Program
Consists of workshops in chosen genres and course work culminating in a final project (the master's thesis or manuscript) which showcases the writer's cultivated talents, in the form of a poetry collection, novel, short story collection, essay collection, memoir, full-length work of nonfiction, screenplay, or full-length play. The M.F.A. requires students to write in two genres, allowing for creative movement within disciplines. Structure and focus in screenwriting and playwriting can also be applied to fiction and nonfiction, and lyricism and metaphor in poetry can also enhance description and dialogue in the other genres, for example. Students engage in course work in varied areas of directing and acting, in film history and literature, in literary criticism and translation. Requirements consist of 56 units of course work.

Course Requirements

1. Six low residency genre workshop courses.
2. Six low residency literature, poetry, and film seminars.
3. Six low residency cross genre workshops.
4. Thesis or manuscript. In the areas of playwriting and screenwriting, the final written project is a full-length play of two or three acts (90–120 pages) or screenplay or teleplay (approximately 120 pages). In the areas of poetry, fiction, and nonfiction, the final written project is a poetry collection (approximately 60 pages), novel, short story collection, essay collection, memoir or full-length nonfiction work (between 100-200 pages). Each student is paired with three faculty members who serve as the thesis advisor(s).
5. One unit Professional Fundamentals Course.

Normative Time to Degree 7 quarters

Creative Writing Program Graduate Courses

CWLR 200 Professional Fundamentals 1 Colloquium, .5 hours; consultation, .5 hours; practicum, .5 hours. Prerequisite(s): graduate standing. Focuses on professional development. Involves mechanics of industry queries, book proposals, contracts, rights, and agent interviews. Culminates in craft lecture during residency. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 2 units.

CWLR 201 (E-Z) Low Residency Seminar in Literature,theatre, and Film 4 to 6 Seminar, 21 hours per quarter; activity, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. A study of a period, style, author, or issue in relation to literary, theatrical, or film history. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Course is repeatable.

CWLR 202 (E-Z) Low Residency Seminar in Literature,theatre, and Film 2 to 4 Seminar, 1 hour; extra reading, 3 hours. Prerequisite(s): graduate standing. A study of a period, style, author, or issue in relation to literary, theatrical, or film history. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Course is repeatable.

CWLR 211 (E-Z) Low Residency Genre Workshop 2 to 4 Activity, 3 hours; workshop, 10 hours per quarter. Prerequisite(s): graduate standing. Focuses on the production of original work. Involves study of chosen genre(s), emphasizing technique, structure, style, and form. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Course is repeatable.

CWLR 212 (E-Z) Low Residency Genre Workshop 4 to 6 Extra reading, 3 hours; workshop, 3 hours. Prerequisite(s): graduate standing. Focuses on the production of original work. Involves study of chosen genre(s), emphasizing techniques, structure, style, and form. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Course is repeatable.

CWLR 221 (E-Z) Low Residency Cross-Genre Workshop 2 to 4 Activity, 3 hours; workshop, 10 hours per quarter. Prerequisite(s): graduate standing. Focuses on the production of original work. Includes introductory study of chosen cross-genres. Emphasizes technique, structure, style, and form. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Course is repeatable.

CWLR 222 (E-Z) Low Residency Cross-Genre Workshop 2 to 4 Extra reading, 3 hours; workshop, 1 hour. Prerequisite(s): graduate standing. Focuses on the production of original work. Includes introductory study of chosen cross-genres. Emphasizes technique, structure, style, and form. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Course is repeatable.

CWPA 200 Advanced Play Analysis 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. An analysis of dramatic structure from a sophisticated perspective. Covers strategies for dealing with openness, ambiguity, and metatheatre. Also discusses tied versus gratuitous elements, archetypes, motifs, and symbolism. Course is repeatable to a maximum of 12 units.

CWPA 201 The Writer's Life: Literary Strategies and Structures 4 Seminar, 3 hours; extra reading, 1 hour; research, 1 hour; written work, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Explores the artistic, practical, and professional aspects of life as a working novelist, poet, playwright, screenwriter, or essayist. Topics include publishing, literary journals, commercial magazines, the film industry, the theatre industry, agents, and overviews of genre and art.

CWPA 210 Literature and Improvisation: the Intersection of Culture and Performance 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the literary and performative tools needed to construct original, language-based plays. Combines improvisational performance with storytelling to challenge students to develop and explore the connectivity between cultural history, oral tradition passed on through personal narratives, and public discourse.

CWPA 214 Acting For Writers 4 Lecture, 2 hours; discussion, 2 hours; research, 2 hours. Prerequisite(s): CWPA 264 or CWPA 266; graduate standing. Examines the theory and practice of acting to enable writers to better understand how language reflects character, as well as how actors turn the written word into spoken language. Includes text work and improvisation. Credit is awarded for only one of CWPA 214 or TFDP 114.

CWPA 226 Contemporary American Theatre 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Investigates contemporary American theatre through frequently produced plays, critical discourses, economics, gender and racial dynamics, and behind-the-scenes institutional operations.

Course is repeatable to a maximum of 12 units.

CWPA 227 Theories of the Modern Theatre 4 Seminar, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the major theories underlying twentieth-century theatre practice. Emphasizes the wide range of styles in modern theatre, including realism, symbolism, expressionism, surrealism, absurdism, Epic Theatre, and Theatre of Cruelty.

CWPA 230 Creative Nonfiction 4 Workshop, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor; consent of program chair is required for students with credit for CWLR 211N, CWLR 212N, CWLR 221N, or CWLR 222N; A formal study of contemporary creative nonfiction. Emphasizes style, structure, and form. Focuses on the production of original work. Course is repeatable to a maximum of 36 units.

CWPA 231 Directing For Writers 4 Seminar, 3 hours; extra reading, 1 hour; research, 1 hour; written work, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An examination of the theory and practice of directing for the stage. Enables writers to better understand how to produce their own work and to interact more effectively with directors.

CWPA 246 Special Topics in Fiction 4 Seminar, 3 hours; extra reading, 3 hours; term paper, 1 hour. Prerequisite(s): graduate standing. Explores various movements and themes in literature. Course is repeatable to a maximum of 24 units.

CWPA 250 Theory For Writers 4 Workshop, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A survey of literary theory designed especially for creative writers. Focuses on aspects of various theories that might be useful for creative work. Involves a close reading of theoretical texts with a strong emphasis on issues of form.

CWPA 251 Hollywood and the Novel: the Transformation of Fiction Into Film 4 Lecture, 3 hours; screening, 1 hour; extra reading, 2 hours; research, 2 hours; written work, 1 hour. Prerequisite(s): graduate standing. Explores the transformation of novels into screenplays and films. Examines four novels and their corresponding screenplays and films. Focuses on differences in style, content, and format. Course is repeatable as content changes to a maximum of 8 units.

CWPA 252 (E-Z) Theory and Craft of Writing 4 Seminar, 3 hours; extra reading, 1 hour; research, 2 hours. Prerequisite(s): graduate standing. Analyzes writing techniques, structures, and approaches to the craft in traditional, contemporary, and avant-garde literary works. E. Fiction; F. Poetry; G. Nonfiction; I. Playwriting; J. Screenwriting; K. First Person. Course is repeatable to a maximum of 36 units.

CWPA 253 Stories as Collections 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing in Creative Writing and Writing for the Performing Arts. An analysis of the order, shape, and structure of story collections to aid in an appreciation of characters, conflicts, and themes. Course is repeatable as content changes to a maximum of 8 units..

CWPA 255 The Graphic Novel 4 Seminar, 3 hours ;studio, 3 hours; extra reading, 1.5 hours; research, 1.5 hours. Prerequisite(s): graduate standing. An in-depth consideration of the historical development and craft of graphic novels. Examines the intellectual, literary, and artistic evolution of this narrative form.

CWPA 256 Contemporary Literature of the Middle East 4 Seminar, 3 hours; extra reading, 3 hours; term paper, 1 hour. Prerequisite(s): graduate standing. An overview of contemporary literature from the Middle East. Proposes some of the ways in which the historical and cultural aspects of Islamic literature differ from that of Western culture. Includes English translations of works in Arabic, Persian, Turkish, Dari, and Urdu. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CWPA 257 The Sufis 4 Seminar, 3 hours; term paper, 2 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to sufism through an in-depth reading of the great Sufi poets. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with RLST 257.

CWPA 260 Shakespeare and Film 4 Seminar, 3 hours; research, 1 hour; screening, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the influence of Shakespeare on film from faithful adaptations to broad reinventions of his works. Compares Shakespeare in his period and the present; the wide range of movies that Shakespeare inspired; and how modern filmmakers deal with issues of language and structure.

CWPA 261 Directing For Writers 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CWPA 266; graduate standing. Examines the methods used by directors to break down a screenplay. Develops the skills to write scripts that are realistically doable and attract directors, producers, and actors. Includes learning the directing responsibilities of casting, directing actors, working within a budget, choosing locations, and working with producers

CWPA 262 Fiction 4 Workshop, 3 hours; extra reading, 4 hours. Prerequisite(s): graduate standing or consent of instructor; consent of program chair is required for students with credit for CWLR 211F, CWLR 212F, CWLR 221F, or CWLR 222F. A formal study of contemporary fiction. Emphasizes style, structure, and form. Focuses on production of original work. Course is repeatable to a maximum of 36 units.

CWPA 263 Fiction Workshop 4 Workshop, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): graduate standing A comprehensive introduction to the craft of fiction writing. Develops fiction writing abilities and critiquing skills of the genre. Intended for students whose primary emphasis is not fiction. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CWPA 264 Playwriting 4 Workshop, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Intensive formal study of playwriting with emphasis on plot, character, theme, dialogue, and style. Course is repeatable.

CWPA 266 Screenwriting 4 Workshop, 3 hours; consultation, 1 hour; screening, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Involves outline and completion of an initial draft of a feature-length screenplay. Also includes a comparison study of two movies in the same genre. Course is repeatable.

CWPA 267 Writing For Television 4 Workshop, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor; consent of program chair is required for students with credit for CWLR 211S, CWLR 212S, CWLR 221S, or CWLR 222S. Provides intensive formal study of writing for television. Emphasizes creating guidelines for a one-hour pilot and a 13-episode series. Course is repeatable to a maximum of 24 units.

CWPA 268 Writing the Half-Hour Television Comedy 4 Workshop, 3 hours; written work, 3 hours. Prerequisite(s): graduate or professional standing or written consent of instructor. Introduction to the style, form, content, and creation of a half-hour television comedy series. Course is repeatable to a maximum of 8 units.

CWPA 269 Rewriting the Script 4 Workshop, 4 hours. Prerequisite(s): CWPA 264 or CWPA 266; and graduate standing; or consent of instructor; consent of instructor is required for students repeating the course. Addresses the processes involved in rewriting a full-length script (screenplay or play). Credit is awarded for only one of CWPA 269 or TFDP 169.

CWPA 270 Poetry Workshop 4 Workshop, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive formal study of contemporary poetry with emphasis on style, structure, and form. Focuses on production of original work. Course is repeatable to a maximum of 36 units.

CWPA 276 Poetry and Translation 4 Workshop, 3 hours; extra reading, 1.5 hours; research, 1.5 hours. Prerequisite(s): graduate standing; reading proficiency in Spanish. Discusses the efficacy and difficulty of translating poetry from the Spanish language into English. Explores the works of twentieth- and twenty-first century major Spanish language poets. Provides a forum to render and compare translations. Cross-listed with SPN 277.

CWPA 277 Poetry and the Sacred 4 Seminar, 2 hours; extra reading, 2 hours; research, 2 hours; written work, 2 hours. Prerequisite(s): graduate standing An in-depth introduction to sacred poetic texts from antiquity to the present. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CWPA 278 Contemporary American Poetry 4 Workshop, 3 hours; extra reading, 3 hours; written work, 1 hour. Prerequisite(s): graduate standing. Focuses on influential contemporary American poets. Discusses their styles and the evolution of poetry over the last fifty years. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 8 units.

CWPA 279 The Fire This Time: Twentieth-Century Poetry of Witness 4 Seminar, 3 hours; extra reading, 1 hour; research, 1 hour; written work, 1 hour. Prerequisite(s): graduate standing. Examines the poetry of crises and witness written by poets in the twentieth and twenty-first centuries from America and around the world. Topics may include war; genocide; religious, ethnic, and political persecution; exile; imprisonment; ecological degradation; and domestic and urban violence in the United States.

CWPA 280 Writers' Colloquium 1 Colloquium, 1 hour. Prerequisite(s): graduate standing. Colloquia featuring writers in fiction, nonfiction, poetry, playwriting, and screenwriting. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 6 units.

CWPA 282 Film Noir: Stories and Cinema From the Shadows 4 Seminar, 2 hours; screening, 2 hours; research, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Examines the genre of fiction and cinema known as "film noir." Looks at films, writing, and art to understand how "film noir" reshapes the way America looks at itself. Each week examines a different aspect of the genre, combining readings and films to understand its roots and rules.

CWPA 283 Multigenre Workshop 4 Workshop, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A peer-review workshop for students with ongoing projects in any and all genres. Focuses on student work that can profit from exposure to readings by people working in a number of different genres. Course is repeatable to a maximum of 16 units.

CWPA 285 The Literary Memoir 4 Workshop, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. An in-depth survey of the literary memoir. Explores how memoirists employ craft and memory to create meaning. Addresses what obligation memoirists have to drama and to real lives and places. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

CWPA 288 Thesis/Manuscript Workshop 4 Workshop, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Designed for M.F.A. students working on their thesis or manuscript, usually in the last two quarters of the program. Open to any and all genres. Focuses on student work, emphasizing the completion of thesis and manuscript projects.

CWPA 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Literature studies directed by a faculty member on special topics. Course is repeatable.

CWPA 292 Concurrent Analytical Studies in Creative Writing and Writing For the Performing Arts 1 to 4 Research, 3 to 12 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Taken concurrently with a 100-series course but on an individual basis. Devoted to research, criticism, and written work related to the 100-series course. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CWPA 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Develops a creative writing project with possibility of publication or production, and not specifically intended for thesis, final project manuscript, or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

CWPA 299 Research For the Thesis Or Manuscript 1 to 12 Thesis, 3 to 36 hours Prerequisite(s): graduate standing; and consent of thesis or manuscript director. Research and preparation for the Master of Fine Arts thesis or manuscript. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 24 units.

Professional Courses

CWPA 301 Directed Studies in the Teaching of Creative Writing and Writing For the Performing Arts 4 Lecture, 2 hours; practicum, 1 hour; research, 2 hours; written work, 3 hours. Prerequisite(s): graduate standing; enrollment in the M.F.A. program in Creative Writing and Writing for the Performing Arts. Prepares for teaching introductory undergraduate Creative Writing courses by offering a flexible curriculum of meetings and conferences on effective pedagogical methodology. Includes creating course syllabi and lesson plans and discussing a range of practical teaching issues. Required of all TAs for at least one quarter. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

CWPA 302 Teaching Practicum 1 to 4 Consultation, 1 to 4 hours; practicum, 2 to 8 hours. Prerequisite(s): graduate standing. Supervised teaching in undergraduate Creative Writing courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Palm Desert Low Residency Program

Graduate Courses

See also graduate courses in the Theatre, Film and Digital Production section of this catalog.

CWLR 200 Professional Fundamentals 1 Colloquium, .5 hours; consultation, .5 hours; practicum, .5 hours. Prerequisite(s): graduate standing. Focuses on professional development. Involves mechanics of industry queries, book proposals, contracts, rights, and agent interviews. Culminates in craft lecture during residency. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 2 units.

CWLR 201 (E-Z) Low Residency Seminar in Literature,theatre, and Film 4 to 6 Seminar, 21 hours per quarter; activity, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. A study of a period, style, author, or issue in relation to literary, theatrical, or film history. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Course is repeatable.

CWLR 202 (E-Z) Low Residency Seminar in Literature,theatre, and Film 2 to 4 Seminar, 1 hour; extra reading, 3 hours. Prerequisite(s): graduate standing. A study of a period, style, author, or issue in relation to literary, theatrical, or film history. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Course is repeatable.

CWLR 211 (E-Z) Low Residency Genre Workshop 2 to 4 Activity, 3 hours; workshop, 10 hours per quarter. Prerequisite(s): graduate standing. Focuses on the production of original work. Involves study of chosen genre(s), emphasizing technique, structure, style, and form. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Course is repeatable.

CWLR 212 (E-Z) Low Residency Genre Workshop 4 to 6 Extra reading, 3 hours; workshop, 3 hours. Prerequisite(s): graduate standing. Focuses on the production of original work. Involves study of chosen genre(s), emphasizing techniques, structure, style, and form. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Course is repeatable.

CWLR 221 (E-Z) Low Residency Cross-Genre Workshop 2 to 4 Activity, 3 hours; workshop, 10 hours per quarter. Prerequisite(s): graduate standing. Focuses on the production of original work. Includes introductory study of chosen cross-genres. Emphasizes technique, structure, style, and form. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Course is repeatable.

CWLR 222 (E-Z) Low Residency Cross-Genre Workshop 2 to 4 Extra reading, 3 hours; workshop, 1 hour. Prerequisite(s): graduate standing. Focuses on the production of original work. Includes introductory study of chosen cross-genres. Emphasizes technique, structure, style, and form. F. Fiction; N. Nonfiction; P. Poetry; S. Screenwriting; T. Playwriting. Course is repeatable.

Dance

Subject abbreviation: DNCE
College of Humanities, Arts, and Social Sciences

taisha Paggett, M.F.A., Chair
Department Office, 102 Arts
dance.ucr.edu

Anthea Kraut, Vice Chair
Department Office, 206 Arts

Professors Emeriti

Wendy L. Rogers, M.A.
Susan Rose, M.F.A.
Marta Savigliano, Ph.D.
Christena Lindborg Schlundt, Ph.D.
Fred Strickler, B.S.
Linda J. Tomko, Ph.D.

Professors

Anthea Kraut, Ph.D.
Jacqueline Shea Murphy, Ph.D.
Joel Mejia Smith, M.F.A.

Associate Professors

Imani Kai Johnson, Ph.D.
Anusha Kedhar, Ph.D.
taisha paggett, M.F.A.
Jose Reynoso, Ph.D.

Assistant Professors

DaEun Jung, M.F.A.
Heather Rastovac Akbarzadeh, Ph.D.
María Regina Firmino-Castillo, Ph.D.

**

Lecturers

Brandon J. Aiken
Emily Barasch, M.F.A.
Toni Pasion, M.A.

Major

The Dance major is distinctive for its outstanding faculty of nationally and internationally recognized artists and scholars who draw from a variety of creative and academic backgrounds, including dance making, choreography, visual and performance art, creative writing, literature, African diasporic ritual cultures, Hip Hop and street dance, Latin Social dance, Indian diasporic dance, Korean dance, Hulu and Philippine folk dance, ballet and modern forms, Indigenous studies, digital technologies, performance studies, queer studies, and cultural studies.

The B.A. degree in Dance focuses on dance making and the cultivation of cultural and historical perspectives on dance. Movement practice, dance composition, performance, and critical dance studies courses are required. Elective courses are also required. Movement practice courses are offered in a variety of dance/movement forms. Dance majors choose an emphasis in Dance Making or Dance Studies. Majors participate in "Spring Forward" and "UCR is Dancing," the department's annual concert series featuring original dance works and performance projects by students.

In addition, visiting professional dancers, choreographers, and scholars come to UCR frequently to give special workshops, master classes, and lectures.

Opportunities to perform include the concerts listed above, MFA students' final projects, and programming connected to repertory classes.

Dance majors are eligible for the Marius de Brabant (formerly Chancellor's Performance) Award, a scholarship of up to $3,000. Majors may also apply for research support and opportunities through the Center for Undergraduate Research and Engaged Learning.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The Dance major focuses on two broad areas of study: Dance Making and Dance Studies. After completing a number of shared required courses, Dance majors will choose an emphasis in either Dance Making or Dance Studies and complete a Capstone Research Seminar.

1. **Lower-division requirements (8 units):** DNCE 014, DNCE 019
2. Dance Making (12 units): Three courses from DNCE 115E, DNCE 115F, DNCE 115G, DNCE 115J, DNCE 115K, DNCE 115M
3. Dance Studies: (8 units), 2 courses from the following: DNCE 131/GSST 127, DNCE 132, DNCE 133, DNCE 134, DNCE 135, DNCE 136
4. Movement Practice (up to 24 units)

   Dance majors must enroll in at least one movement practice course per quarter, and must pursue a concentration in two different dance genres of at least 6 units each. Up to 24 units may be counted towards the major from:

   a) DNCE 066A, DNCE 066B (West African Dance)

   b) DNCE 067A, DNCE 067B, DNCE 067C (Modern Technique)

   c) DNCE 068 (Somatics)

   d) DNCE 069A, DNCE 069B (18th Century Dance)

   e) DNCE 070A, DNCE 070B, DNCE 070C (Hip Hop Dance)

   f) DNCE 071A, DNCE 071B (Ballet)

   g) DNCE 073A, DNCE 073B (Jazz Dance)

   h) DNCE 074A, DNCE 074B (Yoga for Dancers)

   i) DNCE 075A, DNCE 075B (Dance Techniques and Practices)

   j) DNCE 081, DNCE 181 (Dance Cultures, Culture in Dance)

Dance Making Emphasis:

1. Eight units from Dance Making/Practice Electives:

   DNCE 167, DNCE 168, DNCE 180(E-Z), DNCE 181*, or any DNCE 115(E-Z) not used to fulfill requirement #2 above.

No more than 4 units may be drawn from the following movement practice courses to fulfill this eight unit elective requirement:

DNCE 066A, DNCE 066B, DNCE 067A, DNCE 067B, DNCE 067C, DNCE 068, DNCE 069A, DNCE 069B, DNCE 070A, DNCE 070B, DNCE 070C, DNCE 071A, DNCE 071B, DNCE 073A, DNCE 073B, DNCE 074A, DNCE 074B, DNCE 075A, DNCE 075B, DNCE 081*

2. Four units from Dance Studies Electives: DNCE 155 (E-Z), DNCE 161/MCS 161, DNCE 162/MCS 162, DNCE 171 (E-Z)/MCS 151 (E-Z), DNCE 172 (E-Z), DNCE 173 (E-Z), DNCE 181* or any of DNCE 131/GSST 127, DNCE 132, DNCE 133, DNCE 134, DNCE 135, DNCE 136 not used to fulfill requirement #3 above,

*DNCE 081 and 181 may be used to fulfill either the Dance Making or the Dance Studies requirement, but not both.

3. Production: DNCE 140
4. Dance Making Capstone:

   a) DNCE 188

   b) DNCE 189E

Dance Studies Emphasis:

1. Eight units from Dance Studies Electives: DNCE 155 (E-Z), DNCE 161/MCS 161, DNCE 162/MCS 162, DNCE 171 (E- Z)/MCS 151 (E-Z), DNCE 172 (E-Z), DNCE 173 (E-Z), DNCE 181* or any of DNCE 131/GSST 127, DNCE 132, DNCE 133, DNCE 134, DNCE 135, DNCE 136 not used to fulfill requirement #3 above,
2. Four units from Dance Making/Practice Electives:

   DNCE 066A, DNCE 066B, DNCE 067A, DNCE 067B, DNCE 067C, DNCE 068, DNCE 069A, DNCE 069B, DNCE 070A, DNCE 070B, DNCE 070C, DNCE 071A, DNCE 071B, DNCE 073A, DNCE 073B, DNCE 074A, DNCE 074B, DNCE 075A, DNCE 075B, DNCE 081*, or any DNCE 115 (E-Z) not used to fulfill #2 above.

*DNCE 081 and 181 may be used to fulfill either the Dance Making or the Dance Studies requirement, but not both.

3. Dance Studies Capstone: DNCE 189F

Minor

Students who minor in Dance receive introductions to dance making, movement practices, and critical dance studies that enable them to pursue upper-division courses germane to a particular focus in dance.

1. **Lower-division preparation (14 units)**

   a) DNCE 014, DNCE 019

   b) Six (6) units from movement practice courses: DNCE 066A, DNCE 066B, DNCE 067A, DNCE 067B, DNCE 067C, DNCE 068, DNCE 069A, DNCE 069B, DNCE 070A, DNCE 070B, DNCE 070C, DNCE 071A, DNCE 071B, DNCE 073A, DNCE 073B, DNCE 074A, DNCE 074B, DNCE 075A, DNCE 075B, DNCE 081

2. **Upper-division requirements (16 units):** 4 courses from DNCE 114A, DNCE 114B, DNCE 114C, DNCE 115E-Z, DNCE 131/GSST 127, DNCE 132, DNCE 133, DNCE 134, DNCE 135, DNCE 136, DNCE 140, DNCE 155 (E-Z)/MUS 155 (E-Z), DNCE 161/MCS 161, DNCE 162/MCS 162, DNCE 171 (E-Z), DNCE 172 (E-Z), DNCE 173 (E-Z), DNCE 180 (E-Z), DNCE 181

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and

Programs section of this catalog for additional information on minors.

Graduate Program

The Department of Dance offers a Master of Arts (M.A.) in Critical Dance Studies, a Master of Fine Arts (M.F.A.) in Experimental Choreography, and a Ph.D. in Critical Dance Studies.

Master's Degrees

M.A. in Critical Dance Studies

Admission

Students gaining admission to the Ph.D. program in Critical Dance Studies may, after advisement and with the approval of the faculty committee, elect to pursue an M.A. degree in Critical Dance Studies.

Plan I (Thesis)

Students must complete a minimum of 36 quarter units of undergraduate (100 series) and graduate (200 series) courses. At least 24 of these units must be in graduate courses and must include the following UCR courses:

- DNCE 239 (Introduction to Graduate Study of Dance)
- DNCE 254 (Political Approaches to Dance Studies)
- DNCE 255 (Historical Approaches to Dance Studies)
- DNCE 257 (Rhetorical Approaches to Dance Studies)
- DNCE 258 (Cultural Approaches to Dance Studies)

A maximum of 12 units of DNCE 299 (thesis research) can be counted towards the 36-unit minimum. Other courses (to fulfill the 36-unit requirement) should be selected, with the consent of the program graduate advisor, from relevant upper-division and graduate courses. The units must be taken for a letter grade and can include, but are not limited to: DNCE 200-level seminar courses (DNCE 239-244; 254-255; 257-258; 260 (E-Z); 264-265 (E-Z); 267); DNCE 280; an upper-division undergraduate-level course paired with 2 units of 292 (Concurrent Analysis).

Candidates for the degree must prepare and present an acceptable thesis to the Department of Dance.

M.F.A. in Experimental Choreography

offers emerging and established artists a site for intense investigation in dance making, performance, and interdisciplinary embodied practice. Over the course of six quarters, students engage in a series of core composition courses and select critical dance studies courses that focus on and address current and urgent questions in the field, and that center experimentation and interdisciplinarity in their approaches. Each quarter students pair with a faculty mentor, four quarters of which are for the Graduate Critique Panels (GCP), to engage intimately with their independent creative practices and show their work for critical feedback and progress evaluation. During the second year of the program students are required to share their work publicly as part of the MFA Fourth Quarter Showings (4QS), from which they begin to develop their final projects and form their committees. The final project demonstrates a thorough investigation and committed execution of a specific set of critical questions unique to their cumulative research, and includes a public artist talk and a written reflective/theoretical document.

UCR's M.F.A. program is unique for the close relationship it maintains with the Ph.D. in Critical Dance Studies, one of the preeminent programs for intellectual inquiry in the field of cultural, political, and historical studies of dance. Cooperation between these two programs, both conceptually and through intersecting curricula, contributes to the department's embrace of dance making and scholarship as complementary modes of investigation. M.F.A. students are equally enriched by the professional relationships they develop with our undergraduate population through teaching, directing, producing, and community engagement. Several venues on and off campus, including our Performance Lab, Studio Labs, and the Culver Center of the Arts downtown, are available for students to share their research.

Financial assistance includes teaching assistantships and fellowships for community projects through the Gluck Fellows Program of the Arts. Students are also eligible to apply for fellowship support from Graduate Division to help fund a portion of their second year of study.

Admission

The program is especially designed for established practicing artists who desire to return to university as a site for deeper engagement and reflection, individuals who demonstrate an invested creative practice and readiness to expand and challenge their established research.

Applicants to the program should demonstrate significant professional experience as an active dance, visual or performance artist making and producing work, and who desire to contextualize their aesthetic inquiry through the study of historical, cultural, and political perspectives.

Three digital samples of original creative work that exemplify the applicant's research and point of view of their embodied praxis, are required.

Applicants must have a B.A. or B.F.A. degree from an accredited institution.

Contact the department for specific details.

Course Work

Requirements consist of 40 units of course work (as set out below) and 12-14 units of independent research for a final project. Students' total number of units of graduate and upper-division undergraduate courses must equal at least 54. The core curriculum, normally to be completed in the first two years of residency, shall comprise the following 16 units:

- DNCE 240 (Improvising Choreography: Scores, Structures, and Strategies)
- DNCE 241 (Creating the Experiment: Identifying the New)
- DNCE 242 (Dancing Representation: Figures, Forms, and Frames)
- DNCE 243 (Collaborating in Dance Making: Materials, Methods, and Interactions)

Students must also take 4 units in each of the following:

- DNCE 180R (Dance Practicum: Pedagogy)
- DNCE 239 (Introduction to Graduate Study of Dance)
- DNCE 244 (Special Topics in Dance Making)

In addition, students must complete 8 units from the following Critical Dance Studies courses:

- DNCE 254 (Political Approaches to Dance Studies)
- DNCE 255 (Historical Approaches to Dance Studies)
- DNCE 257 (Rhetorical Approaches to Dance Studies)
- DNCE 258 (Cultural Approaches to Dance Studies)
- DNCE 260 (Special Topics in Critical Dance Studies)
- DNCE 264 (Oral History and Ethnographic Methods)
- DNCE 267 (Choreographies of Writing)

Students must also take Dance 301, (which does not count toward the total 54 units required for the degree) plus 4-6 graduate- level units of electives either within or outside the Dance Department. These units must be taken for a letter grade and can include, but are not limited to: any of the core PhD courses (DNCE 254, 255, 257 & 258) not previously taken; a Dance 200-level seminar course in critical dance studies (DNCE 260, 264 & 267); DNCE 280 (Colloquium); the bundling of an upper-division undergraduate-level course with 2 units of 292 (Concurrent Analysis).

An additional 12-14 units are taken through DNCE 297 or DNCE 299 for independent creative research work with faculty mentors on their Graduate Critique Panels, and on phases of the final project. During the second year, students form a committee consisting of three–four faculty members, one of whom may be outside the department. The committee approves the project proposal and supervises the final project.

Foreign Language Requirement None

Written and/or Oral Qualifying Examination

During the second year, the student writes a 10–15-page proposal for the final project to be approved by the committee.

Final Project

The final project may take shape in many forms in which the student's research is made evident. For example, students may 1) undertake to create site-specific performances occurring in different locales over several months, 2) organize opportunities for interactive choreography with distinct groups of performers, 3) develop a digital media or film project, or 4) create a portfolio of many distinct but connected projects. Whatever its final form, the project must demonstrate a thorough investigation and committed execution of a defined aesthetic concern. Students are also required to give a 30 -minute public artist talk followed by Q&A, and produce a 20-40 page written document to be completed within one quarter of the performance/project event, which outlines the aesthetic focus of the student's research,

reflects on the creative process, and provides a historical and philosophical contextualization for the project.

Normative Time to Degree 7 quarters

Doctoral Program

Ph.D. in Critical Dance Studies

The Ph.D. program in Critical Dance Studies provides an advanced interdisciplinary base for innovative research in the field of cultural, political, and historical studies of dance. The program of study embraces a theoretical consideration of all dimensions of the practice of dance. These dimensions include, but are not limited to, body politics; media and digital cultures; globalization and cultural translation; race, ethnicity, sexuality, and gender; mobilization and class; and corporeal knowledges and choreography. In addition to theoretical and historical concerns, the program promotes the articulation of a variety of methodological approaches to the analysis of bodily performance.

UCR faculty put into motion various modes of production: performance studies, history, ethnography, critical race theory, feminist studies/masculinities & queer studies, Marxism or post-Marxism, and other specific area studies related to, for example, South Asian, Asian Diaspora and Asian American studies, African Diaspora studies, Indigenous studies, Latina/Latin American studies, and Global South studies. The program provides a provocative environment for investigating cutting-edge strategies for original scholarly work in dance.

Admission

Students must meet the general requirements for admission to the Graduate Division as shown in the Graduate Studies section of this catalog. Students may submit a statement of background about experience in dance history and theory, a previously prepared research paper, or the equivalent, demonstrating analytical and interpretive skills.

Prerequisites include the following:

1. A working knowledge of movement
2. An acquaintance with some system of movement observation and analysis
3. Preparation in general historical and cultural studies

Deficiencies may be corrected with appropriate course work.

Course Work

Core curriculum normally to be completed in the first two years of residency includes the following:

DNCE 239 (Introduction to Graduate Study of Dance)

DNCE 254 (Political Approaches to Dance Studies)

DNCE 255 (Historical Approaches to Dance Studies)

DNCE 257 (Rhetorical Approaches to Dance Studies)

DNCE 258 (Cultural Approaches to Dance Studies)

DNCE 301 (Seminar in Dance Studies Pedagogy and Professional Development)

Two additional graduate-level courses (minimum 8 units) are required from other disciplines (not DNCE) related to the student's research interest. Courses must be taken for a letter grade and can include an upper-division undergraduate-level course paired with 2 units of 292 (Concurrent Analysis).

Four additional graduate-level courses (minimum 16 units) from Dance must be taken for a letter grade and can include, but are not limited to: DNCE 200-level seminar courses (DNCE 260 (E-Z), 264 & 267) in critical dance studies; DNCE 280; an upper-division undergraduate-level course paired with 2 units of 292 (Concurrent Analysis).

A maximum of one Dance MFA core course (DNCE 240 to 243) may be included as one of the four additional graduatelevel dance courses required.

Written Qualifying Examination

Students must prepare one field for examination with each of four members of the committee in whose courses the student has ideally completed degree requirements. The committee is composed of two Dance faculty members, one of whom is chair, and two other members who may be Dance faculty or faculty who are not a UCR Dance faculty member or cooperating faculty member. The written qualifying examination may be completed as a "take-home" format (seven-day, open-book) or a "sit-in" format (two-hour exam periods for each field, conducted on site in the department, and completed in one five-day work week). The recommended page length for each exam is 10-12 pages (double-space).

Qualifying Essay

One quarter after successfully completing the written examination, students complete a rough draft of the qualifying essay, under the direction of the chair. Students finalize the qualifying essay and sit for the oral examination before the end of the following quarter. The qualifying essay is generally 25 pages (double-space) in length and demonstrates the student's ability to articulate a viable dissertation research project. It must consist of written work but may include other forms of video or film productions with the approval of the relevant committee and the graduate advisor.

Oral Qualifying Examination

Students must prepare a qualifying essay that proposes a viable dissertation research project and be examined by a five-person oral qualifying examination committee. The committee, chosen in consultation with the student, nominated by the department and appointed by the Vice Provost and Dean of Graduate Studies, consists of all four written examination committee members, plus a fifth oversight member. The five-person committee will be comprised of no more than two faculty members from outside the department, and no fewer than one faculty member from outside the department. All committee members should normally be voting members of the UC Academic Senate. Any exceptions must be accompanied by the nominee's CV and justification from the graduate advisor. The request will be evaluated by the Graduate Division based on the nominee having comparable education and experience to a UC Academic Senate member and that no other UCR senate faculty has the same knowledge. All members of the committee must be present either in person or virtually for the exam depending on the exam modality selected (see below).

The committee examines the adequacy of the student's preparation to conduct the research proposed in the qualifying essay. Advancement to candidacy for the doctoral degree depends on completing required course work and passing the written examination, qualifying essay, and the oral examination.

The Dance department expects students to complete the entire examination process by the end of their tenth quarter in the program (end of the first quarter of their fourth year) to make satisfactory progress toward completing the degree.

Dissertation and Final Defense

A dissertation committee is composed of at least three members: a chair from Dance, a Dance faculty member, and either a Dance faculty member, or a faculty member from outside the department. All committee members should normally be voting members of the UC Academic Senate. Any exceptions must be accompanied by the nominee's CV and justification from the graduate advisor. The request will be evaluated by the Graduate Division based on the nominee having comparable education and experience to a UC Academic Senate member and that no other UCR senate faculty has the same knowledge. The committee directs and approves the research and writing of the dissertation. The dissertation must consist of written work but may include other forms of video or film productions with the approval of the relevant committee and the graduate advisor. It must present original scholarly work and be approved by the chair of the dissertation committee before the final defense. Students must have satisfactory performance on a final defense, conducted by the dissertation committee and open to all members of the faculty. The defense emphasizes the dissertation and related topics.

Modalities for Oral Qualifying Exam and Final Defense

Students have the option of in-person, hybrid, or remote modalities for oral qualifying exams and the final defense.

- **In-Person** – student and all committee members are in-person on campus
- **Hybrid** – student and at least one committee member is in-person
- **Remote** – student and all committee members are remote

The modality for the exam/defense will be decided based on consultation with the committee chairperson, the student, and the grad advisor, with the committee chairperson making the final determination.

Exceptions and changes to modalities must be approved by the graduate advisor. If the graduate advisor is the committee chairperson, exceptions and changes to modalities must be approved by the chair of the department. Exceptions and changes must be submitted

in writing to the graduate advisor at least 24 hours before the date of the exam/defense.

Normative Time to Degree 18 quarters

Lower-Division Courses

DNCE 005 Introduction to Dance 4 Seminar, 3 hours; individual study, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): none. A survey of approaches to dancing and dance making, this course introduces students to technique, performance, and composition from various origins. Students will cultivate the ability to enact and remember patterns of rhythm, effort, and visual design in movement. Especially designed for students with no experience in dance.

DNCE 007 Dance: Cultures and Contexts 4 Lecture, 3 hours; discussion, 1 hour. Provides historical and cultural context for selected dance forms and practices. Explores dance as an art form, cultural practice, and meaning-making activity focusing on histories of race, gender, sexuality, class, and nation. Credit is awarded for one of the following DNCE 007 or DNCE 007W.

DNCE 007W Dance: Cultures and Contexts 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in WRIT 040K; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Provides historical and cultural context for selected dance forms and practices. Explores dance as an art form, cultural practice, and meaning-making activity focusing on histories of race, gender, sexuality, class, and nation. Intended for non-majors. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits as alternatives to WRIT 030. Credit is awarded for one of the following DNCE 007W or DNCE 007.

DNCE 012 Dance and Popular Culture 4 Lecture, 3 hours; discussion, 1 hour; written work, 2 hours. Prerequisite(s): none. Introduces students to dance in popular culture and explores its various social, political, and cultural functions and impacts. Examines popular dance practices across various sites including screens both big and small, fitness studios, dance competitions, dance clubs, and protests.

DNCE 014 Introduction to Choreography 4 Lecture, 4.5 hours; individual study, 1.5 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; restricted to major(s) Dance; or consent of instructor. Analysis of basic problems and issues of choreography. Emphasizes improvisational methods as an approach to the investigation of space, time, and energy in motion as the fundamental elements of a dance. Course is repeatable as content or topic changes to a maximum of 8 units.

DNCE 019 Introduction to Dance Studies 4 Lecture, 3 hours; research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): a major or minor in dance; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introduces major concepts, approaches, and issues in the study of dance as a cultural, historical, and artistic practice. Uses text, video, studio, demonstration, and performance to expose students to ways of writing, speaking, researching, and thinking clearly and critically about dance.

DNCE 065A Beginning Latin American Social Dances 2 Studio, 3 hours; extra reading, 1 hour; individual study, 1 hour; screening, 1 hour. Prerequisite(s): none. Explores the fundamentals of various Latin American social dances at the beginning level. Outside-of-class assignments may include assigned readings, attending dance events, viewing dance videos, and regular individual practice sessions. Course is repeatable.

DNCE 065B Intermediate Latin American Social Dances 2 Studio, 3 hours; extra reading, 1 hour; individual study, 1 hour; screening, 1 hour. Prerequisite(s): none. Explores the fundamentals of various Latin American social dances at the intermediate level. Outside-of-class assignments may include assigned readings attending dance events, viewing dance videos, and regular individual practice sessions. Course is repeatable.

DNCE 066A Beginning West African Dance 2 Studio, 3 hours; screening, 1 hour; extra reading, 1 hour; individual study, 1 hour. Prerequisite(s): none. West African dance technique at beginning level. Vigorous class with focus on rhythm, songs, and culture as well as dance choreographies traditionally performed for rites of passage, courtship, coming of age, and storytelling. Emphasizes community building and individual potential. Course is repeatable.

DNCE 066B Intermediate West African Dance 2 Studio, 3 hours; screening, 1 hour; extra reading, 1 hour; individual study, 1 hour. Prerequisite(s): none. West African dance technique at intermediate level. Vigorous class with focus on rhythm, songs, and culture as well as dance choreographies traditionally performed for rites of passage, courtship, coming of age, and storytelling. Emphasizes community building and individual potential. Course is repeatable.

DNCE 067A Beginning Modern Dance Technique 2 Studio, 3 hours; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): none. Modern dance technique at the beginning level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Recommended for nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

DNCE 067B Intermediate Modern Dance Technique 2 Studio, 3 hours; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): DNCE 067A recommended. Modern dance technique at the intermediate level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Course is repeatable.

DNCE 067C Advanced Modern Dance Technique 2 Studio, 3 hours; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): DNCE 067B recommended. Modern dance technique at the advanced level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Course is repeatable.

DNCE 068 Somatic Techniques and Experiential Anatomy 2 Studio, 3 hours; extra reading, 1 hour; individual studio, 2 hours. Prerequisite(s): none. Introduces physical practices and concepts from a variety of somatic techniques. Explores how the body functions through actions and interactions of its structures. Utilizes a possibilities-in-the-field approach to study and embody some of the varied interpretations that can arise from the same set of anatomical facts. Course is repeatable to a maximum of 16 units.

DNCE 069A Beginning Eighteenth-Century Dance 2 Studio, 3 hours; extra reading, 1 hour; individual study, 1 hour; screening, 1 hour. Prerequisite(s): none. Eighteenth-century dance technique at the beginning level. Focuses on movement practices, corporeality, spatial navigation, and relationships with music. Explores dances in historical, cultural, and political frameworks. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Recommended for non-dancers and dancers. Course is repeatable.

DNCE 069B Intermediate Eighteenth-Century Dance 2 Studio, 3 hours; extra reading, 1 hour; individual study, 1 hour; screening, 1 hour. Prerequisite(s): none. Eighteenth-century dance technique at intermediate level. Focuses on movement practices, corporeality, spatial navigation, and relationships with music. Explores dances in historical, cultural, and political frameworks. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Recommended for non-dancers and dancers. Course is repeatable.

DNCE 070A Beginning Hip Hop Dance 2 Studio, 3 hours; extra reading, 1 hour; individual study, 1 hour; screening, 1 hour. Prerequisite(s): none. Hip Hop dance technique at beginning level. High-energy class with focus on dance steps, isolation techniques, rhythm, confidence, and bringing style and personality to movements. Stresses Hip Hop dance as fun, diverse, self-expressive, innovative, and transformative. Grounded in histories of Hip Hop as a cultural movement. Course is repeatable.

DNCE 070B Intermediate Hip Hop Dance 2 Studio, 3 hours; extra reading, 1 hour; individual study, 1 hour; screening, 1 hour. Prerequisite(s): none. Hip Hop dance technique at intermediate level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Recommended for non-

dancers and dancers. Course is repeatable.

DNCE 070C Advance Hip Hop Dance 2 Studio, 3 hours; extra reading, 1 hour; individual study, 1 hour; screening, 1 hour. Prerequisite(s): none. Hip Hop dance technique at advanced level. Outside-of-class assignments include attending dance concerts, viewing dance videos, and regular individual practice sessions. Course is repeatable.

DNCE 071A Beginning Ballet Technique 2 Studio, 3 hours; individual study, 1 hour; extra reading, 1 hour; screening, 1 hour. Prerequisite(s): none. Ballet technique at the beginning level. Assignments include attending dance concerts and other dance showings. Recommended for nondancers and dancers. Course is repeatable.

DNCE 071B Intermediate Ballet Technique 2 Studio, 3 hours; individual study, 1 hour; extra reading, 1 hour; screening, 1 hour. Prerequisite(s): DNCE 071A recommended. Ballet technique at the intermediate level. Assignments include attending dance concerts and other dance showings. Course is repeatable.

DNCE 073A Beginning Jazz Dance 2 Studio, 3 hours; extra reading, 1 hour; individual study, 1 hour; screening, 1 hour. Prerequisite(s): none. Jazz dance technique at beginning level. Focuses on rhythms, isolations, syncopation, and performance quality. Students learn a variety of jazz styles from lyrical to funk and classical to musical theater. Outside-of-class assignments include readings, video viewings, and written assignments in historical, cultural, and aesthetic issues pertaining to jazz dancing. Course is repeatable.

DNCE 073B Intermediate Jazz Dance 2 Studio, 3 hours; extra reading, 1 hour; individual study, 1 hour; screening, 1 hour. Prerequisite(s): none. Jazz dance technique at intermediate level. Focuses on rhythms, isolations, syncopation, and performance quality. Students learn a variety of jazz styles from lyrical to funk and classical to musical theater. Outside-of-class assignments include readings, video viewings, and written assignments in historical, cultural, and aesthetic issues pertaining to jazz dancing. Course is repeatable.

DNCE 074A Beginning Yoga For Dancers 2 Studio, 3 hours; extra reading, 1 hour; individual study, 1 hour; screening, 1 hour. Prerequisite(s): none. Yoga for dancers at beginning level. Focuses on alignment; understanding how to practice safely; increasing strength, flexibility, and balance; developing focus and bodily awareness; and exploring yoga's relation to dance. Coursework includes reading and discussion of yoga texts, concepts, and philosophy. Recommended for non-dancers and dancers. Course is repeatable.

DNCE 074B Intermediate Yoga For Dancers 2 Studio, 3 hours; extra reading, 1 hour; individual study, 1 hour; screening, 1 hour. Prerequisite(s): none. Yoga for dancers at intermediate level. Focuses on alignment; understanding how to practice safely; increasing strength, flexibility, and balance; developing focus and bodily awareness; and exploring yoga's relation to dance. Coursework includes reading and discussion of yoga texts, concepts, and philosophy. Recommended for non-dancers and dancers. Course is repeatable.

DNCE 075A Beginning Dance Techniques and Practices 2 Studio, 3 hours; individual study, 1 hour; extra reading, 1 hour; screening, 1 hour. Prerequisite(s): none. Dance Techniques and Practices at beginning level. Focus varies each quarter. Outside-of-class assignments may include attending dance concerts, writing assignments in historical, cultural and aesthetic issues relating to the quarter's dance form, and regular individual practice sessions. Course is repeatable.

DNCE 075B Intermediate Dance Techniques and Practices 2 Studio, 3 hours; individual study, 1 hour; extra reading, 1 hour; screening, 1 hour. Prerequisite(s): DNCE 075A recommended. Dance Techniques and Practices at intermediate level. Focus varies each quarter. Outside-of-class assignments may include attending dance concerts, writing assignments in historical, cultural and aesthetic issues relating to the quarter's dance form, and regular individual practice sessions. Course is repeatable.

DNCE 081 Dance Cultures, Culture in Dance 4 Lecture, 2 hours; studio, 6 hours. Prerequisite(s): none. Explores non-presentational dance forms that are intricately woven into the culture of a particular society. Focuses on performance integrity and cultural memory. Incorporates videos, books, field trips, and guest lectures in addition to studio time.

Upper-Division Courses

DNCE 114A Dance Composition 1 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): DNCE 007 or DNCE 007W or DNCE 014 and two quarters of dance technique, or equivalent. Analyzes dance as an art form. Emphasizes space, time, and energy in motion as elements in choreographic style. Course content presented at the beginner's level.

DNCE 114B Dance Composition 2 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): DNCE 114A. The continuing analysis of dance as an art form with emphasis on space, time and energy in motion as elements in choreographic style. In DNCE 114B, this is done on the intermediate level.

DNCE 114C Dance Composition 3 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): DNCE 114B. The continuing analysis of dance as an art form with emphasis on space, time and energy in motion as elements in choreographic style. In 114C, this is done on the advanced level.

DNCE 115 (E-Z) Dance Making 4 Lecture, 3 hours; research, 2 hours; studio, 3 hours. Prerequisite(s): DNCE 014. Advanced analysis of dance-making as an art form with emphasis on storytelling, ritual, political activation, site, media and technology, contact, and materials.

DNCE 115E Dance Making: Dance as Storytelling 4 Lecture, 3 hours; studio, 3 hours; research, 2 hours. Prerequisite(s): DNCE 014, or consent of instructor. Focuses on strategies for telling stories through movement and speaking, specifically gestural movement, sign language, singing, breath control, and expression. Addresses how meaning is made and relates to gender, sexuality, race, class and power.

DNCE 115F Dance Making: Dance as Scores 4 Lecture, 3 hours; studio, 3 hours; research, 2 hours. Prerequisite(s): DNCE 014, or consent of instructor. Advanced analysis of dance-making as an art form with emphasis on storytelling, ritual, political activation, site, media and technology, contact, and materials.

DNCE 115G Dance Making: Dance as Ritual 4 Lecture, 3 hours; studio, 3 hours; research, 2 hours. Prerequisite(s): DNCE 014, or consent of instructor. Advanced analysis of dance-making as an art form with emphasis on storytelling, ritual, political activation, site, media and technology, contact, and materials.

DNCE 115J Dance Making: Dance and Traces Past 4 Lecture, 3 hours; studio, 3 hours; research, 2 hours. Prerequisite(s): DNCE 014, or consent of instructor. Advanced analysis of dance-making as an art form with emphasis on storytelling, ritual, political activation, site, media and technology, contact, and materials.

DNCE 115K Dance Making: Dance as Political Activation 4 Lecture, 3 hours; studio, 3 hours; research, 2 hours. Prerequisite(s): DNCE 014 or consent of instructor. Advanced analysis of dance-making as an art form with emphasis on storytelling, ritual, political activation, site, media and technology, contact, and materials.

DNCE 115M Dance Making: Dance and Materials 4 Lecture, 3 hours; studio, 3 hours; research, 2 hours. Prerequisite(s): DNCE 014 or consent of instructor. Advanced analysis of dance-making as an art form with emphasis on storytelling, ritual, political activation, site, media and technology, contact, and materials.

DNCE 123 Southeast Asian Performance 4 Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the roles and genres of expressive culture in Southeast Asia, including dance, music, theater, film, and digital culture. Performance is discussed as both a time-honored and a contemporary medium for cultural production, from the courts to everyday experience. Cross-listed with MUS 123, AST 123, ANTH 126 and SEAS 123

DNCE 127 Music Cultures of Southeast Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in the Philippines, Indonesia, Malaysia, Thailand, Myanmar (Burma), Laos, Cambodia, and Vietnam. Designed for the student interested in the performing arts and cultures of mainland and insular Southeast Asia. No Western music

background is required. Cross-listed with ANTH 176, AST 127, ETST 172, MUS 127, and SEAS 127.

DNCE 128 Performing Arts of Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in four major geocultural regions of Asia: Central, East, South and Southeast. No Western music training is required. Course is repeatable to a maximum of 8 units. Cross-listed with ANTH 128, AST 128, and TFDP 176.

DNCE 131 Dance, Gender, Sexuality 4 Lecture, 3 hours; research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Explores some of the ways that studying dance (an art form whose medium is the body) illuminates feminist, gender, and sexuality studies --- and vice versa. No previous dance experience required. Cross-listed with GSST 127.

DNCE 132 Dance, Citizenship, Location 4 Lecture, 3 hours; research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Explores interconnections between dancing bodies, their geographical, political, cultural locations, and the ways in which they negotiate inclusion or exclusion within state apparatuses of power such as citizenship.

DNCE 133 Dance, Space, Time 4 Lecture, 3 hours; research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Explores the flow among non-presentational and presentational dance forms, state productions and treaties, and design factors that are meant to enable our daily lives such as buildings, parks, and roadways. Students take advantage of video, books, field trips, guest lectures and studio lab time.

DNCE 134 Dance, Genre, Institutions 4 Lecture, 3 hours; research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Explores how dance and movement genres interact with and articulate, but also query and contest, structures, institutions, and traditions such as theatrical performance and touring shows, rites of passage, political contests, educational enterprises, and territorial campaigns through which societies frame experience.

DNCE 135 Dance, Race, Property 4 Lecture, 3 hours; research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Explores intersections between dancing bodies, questions of race, and notions of cultural property. Investigates issues of embodied identity and racialization, cultural appropriation and cultural exchange, purity and hybridity, and ownership and copyright.

DNCE 136 Hip Hop Dance, Collectivity, & Change 4 Lecture, 3 hours; research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently); or consent of instructor. Explores street dance as a lens to consider issues of cultural transmission, ritual practices, gender and sexuality, Western and non-Western aesthetic influences, market forces, and local interests. Familiarizes students with Hip Hop dance scholarship; reconsiders Hip Hop historical narratives through collective enactments; and develops students' critical analysis skills.

DNCE 140 Production Lab 4 Laboratory, 3 hours; workshop, 2 hours; research, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing in Dance; or consent of instructor. An introduction to key dance production and design strategies and practices through hands-on lab and workshop. Coursework culminates in creative design projects and a production portfolio.

DNCE 155 (E-Z) Seminar in Dance and Music 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Introduces relationships and representations between music and dance. Explores musical and choreographic form, compositional strategies, hybridization of style, cultural meanings and registers in which these were made, the agencies such representations enabled, interpretive communities, and cross-cultural interactions. Cross-listed with MUS 155 (E-Z).

DNCE 155E Representations of Spain in Dance and Music, 1700-2000 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces representations of Spain articulated in music and dance of Europe and the Americas from the eighteenth through twentieth centuries. Cross-listed with MUS 155E.

DNCE 155F The Ballets Russes 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores how the Diaghilev Ballets Russes' repertoire and collaborative practices challenged the nature of artistic labor; negotiated traditional patronage and new commercial modes; engaged with cultural nationalism, gender role contention, and emerging models of sexuality; and deployed representational strategies that played into period debates about power and social organization. Cross-listed with MUS 155F.

DNCE 161 Choreographing the Screen 4 Lecture, 3 hours; screening, 2 hours; term paper, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Focuses on choreographing for the camera and the screen. Topics include video art, classic film choreography, music video, and digital dance technologies. Students prepare a choreographic piece for the camera as a final project. Cross-listed with MCS 161.

DNCE 162 Tool, Technology, Technique 4 Lecture, 3 hours; screening, 3 hours; laboratory, 3 hours. Prerequisite(s): DNCE 019 or MCS 019 or consent of instructor. Practicum in video and digital production with an emphasis on capturing and editing the moving body. Students are encouraged to bring their own video or digital recording device. Editing equipment will be available. Cross-listed with MCS 162.

DNCE 167 Dance Production 2 Studio, 6 hours. Prerequisite(s): by audition Study, production, and performance of dances. Course may be repeated for credit.

DNCE 168 Dance Touring Ensemble 4 Studio, 6 hours; research, 3 hours. Prerequisite(s): consent of instructor. Dance Touring Ensemble members work with the instructor to create a lecture-demonstration and create and learn repertory which is performed at various sites within the community. Course is repeatable to a maximum of 16 units.

DNCE 171 (E-Z) Filmic Bodies 4
Prerequisite(s): restricted to class level standing of junior, or senior. For hours and prerequisites, see segment descriptions. Assesses a multiplicity of filmic genres through the portals of the dancing and mobilized body as related to race, gender, class, and other identifiers. Explores the politics of movement on film, the mechanics of making film work, and the political economy of dance on film. Dance experience is usually not required. Course is repeatable to a maximum of units. Cross-listed with MCS 151 (E-Z).

DNCE 171F Ethnographic Representation of Dance On Film: ". . . and Then They Danced 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes the juncture between representation and presentation in everyday dance genres on film. Explores race, class, tropes of authenticity, and ownership of cultural production through screenings, lectures, and theoretical writings. No previous dance experience required. Course is repeatable. Cross-listed with MCS 151F.

DNCE 171G Gender, Mechanization, and Shape 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Utilizes film, video, and texts to examine the relationship among gender, mechanization, and shape during the twentieth century. Focuses on the performing arts, industrial and technological design, and the relationship of visual culture to changing notions of gender. Course is repeatable. Cross-listed with MCS 151G.

DNCE 171J Spectatorship 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the nature of film studies through the eyes of the audience. Uses film, videos, and texts (in addition to outside viewing of films in cinematic locales) to formulate how viewing film constructs the viewer's subjectivity and a film's cultural context. Course is repeatable. Cross-listed with MCS 151J.

DNCE 171K Attractions, Interruptions, Disruptions: Narrative Film:fight Scenes, Dance Sequences,special Effect 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes the way film regulates the movement of bodies on and off screen

through narrative and what happens when the movement exceeds that regulations. Utilizes selected films to explore the fight scenes, dance sequences, and computer generated imagery in film. Includes screenings both in class and outside of class. Course is repeatable. Cross-listed with MCS 151K.

DNCE 171M Bollywood 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the vast corpus of films that constitute the genre called Bollywood. Focuses on the genre's music and dance styles. Includes weekly film screenings. No previous dance experience required. Course is repeatable. Cross-listed with MCS 151M.

DNCE 172 (E-Z) Televisual Bodies 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Analyzes choreographic practices within television broadcast and marketing and their relation to popular culture. Also examines situational or tactical use and misuse of satellite, cablecast, and broadcast television by unintentional audiences that subsequently reconstitute themselves as communities via the programming. Focuses on video as an archival and/or choreographic tool. J. Corporations And Corporealities: Commercials, Culture, And Choreography; K. Television As Location: The Satellite Feed; M. Music Television (mtv) And Popular Culture. Course is repeatable to a maximum of units. Cross-listed with MCS 152 (E-Z).

DNCE 173 (E-Z) Digitized Bodies 4 Lecture, 3 hours; laboratory, 3 hours; screening, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Provides a theoretical approach to digital subjectivities, bodies in motion, products, and realities. Addresses issues of liveness, new media, mediated cultural identities, speed, transfer, telepresence, and coded and encoded sexuality within programming. Focuses primarily on the body-computer interface. J. Digital Games, Violence, And The Body; K. Virtual Subjectivity: Persona, Identity, And Body. Course is repeatable to a maximum of units. Cross-listed with MCS 153 (E-Z).

DNCE 180 (E-Z) Dance Practicum 4 Studio, 8 hours. An investigation of dance production theories and practices. Provides directed experience in a limited topic, with the name of a guest instructor announced in advance if not being taught by UCR staff. E. Cine Dance; F. Folk Forms; G. Advanced Choreography; H. Intermedia Movement; I. Video Dance; J. Repertory; K. Reconstruction Of Dances; L. Theory Of Individual Choreographers; M. Dance For Children; N. Dance In Therapy; O. Improvisation; P. Role Preparation; Q. Dance Notation; R. Pedagogy. Course is repeatable to a maximum of 12 units.

DNCE 181 Dance Cultures, Culture in Dance 4 Lecture, 2 hours; studio, 2 hours; research, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of the instructor. Focuses on ways dance and other movement practices are intricately woven into culture. Incorporates studio practice time as well as videos, books, field trips, and guest lectures; includes completion and presentation of a paper or project.

DNCE 187 Improvisation Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Presents the emergent field of improvisation studies, moving beyond traditional genre boundaries to explore improvisation as a cultural phenomenon and social practice. Draws from jazz studies, ethnomusicology, music theory, musicology, American studies, and the histories of dance, theatre, and the visual arts.

DNCE 188 Individual Projects in Creative Activity 2 Studio, 2 hours; research, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing in Dance; or consent of instructor; Description: Facilitates the discovery and design of a capstone artistic project.

DNCE 189 (E-Z) Capstone Research Seminar 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): DNCE 188; restricted to class level standing of junior, or senior; restricted to major(s) Dance. Capstone course that provides undergraduate students in dance with the experience of synthesizing knowledge and skills gained throughout the dance curriculum. Includes completion and presentation of a paper or project under the guidance of dance faculty.

DNCE 189E Dance Making Project 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): DNCE 188, upper-division standing in Dance; or consent of instructor. Synthesizes the knowledge and skills gained throughout the dance curriculum. Provides dance making emphasis with the opportunity to complete and present an individualized creative research project under the guidance of dance faculty.

DNCE 189F Dance Studies Capstone 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Capstone course that provides a dance studies emphasis. Includes the experience of synthesizing knowledge and skills gained throughout the dance curriculum. Includes completion and presentation of a paper or project under the guidance of dance faculty.

DNCE 190 Special Studies 1 to 5 To be taken with the consent of the Chair of the Department of Dance to meet special curricular problems. Course is repeatable to a maximum of 12 units.

DNCE 198I Individual Internship in Dance 1 to 12 Prerequisite(s): 1) upper-division standing; 2) evidence of prior arrangement with the professional(s) involved; and 3) approval of the UCR dance faculty sponsor. Work with an appropriate professional individual or organization to gain experience and skill in the student's chosen dance-related specialty. May be repeated to a total of 16 units.

Graduate Courses

DNCE 239 Introduction to Graduate Study of Dance 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A graduate-level introduction to the field of critical dance studies. Focuses on the foundational works and issues that have shaped the field. Topics include genealogies of dance studies, approaches to embodiment, the influences of cultural studies and critical theory, and the research of Dance Department faculty.

DNCE 240 Improvising Choreography: Scores, Structures, and Strategies 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An evaluation of the use of the score or structure as a predetermining guide to the production of choreography. Students create choreography in ensemble, co-choreographing dances in the moment of performance and assessing immediately the efficacy of a given approach. Course is repeatable to a maximum of 8 units.

DNCE 241 Creating the Experiment: Identifying the New 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An inquiry into what constitutes an experiment in contemporary dance, critically examining how artists bring new dance into existence. Questions the working process in originating movement, sequencing, and images for dance and assesses this process with respect to larger historical and cultural frameworks. Course is repeatable to a maximum of 8 units.

DNCE 242 Dancing Representation: Figures, Forms, and Frames 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An examination of the systems of representation used to create choreographic meaning. Considers the bodily codes and the cultural associations attached to distinct qualities of movement and the conventions of space, time, and narrative through which a dance achieves its meaning. course is repeatable to a maximum of 8 units.

DNCE 243 Collaborating in Dance Making: Materials, Methods, and Interactions 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An examination of the function of the choreographer as principal director of the dance project. Analysis of various approaches to the making of dance works that involve distinctive forms of collaboration with artists working in allied media. Course is repeatable to a maximum of 8 units.

DNCE 244 Special Topics in Dance Making 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Study of emerging issues in embodied practice, dance creation, and/or dance production. Focus varies by quarter. Topics may include intersections between theoretical and practical approaches to dance; dance and digital technologies; cultural specificity and dance making; curatorial

practices; concepts or models of dance production; and embodying dances past. Course is repeatable as content changes.

DNCE 254 Political Approaches to Dance Studies 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): reading knowledge of a language other than English; working knowledge of notation; graduate standing or consent of instructor. The study of power relations reflected in and enacted by dance practice and performance. Topics include nation formation, imperialism, race, commodification, globalization, economic and class relations, gender, and political affiliation and resistance.

DNCE 255 Historical Approaches to Dance Studies 4 Seminar, 3 hours; studio, 2 to 3 hours. Prerequisite(s): reading knowledge of a language other than English; working knowledge of notation; graduate standing or consent of instructor. The study of dances past and how dance practices have changed over time. May include study of changing modes for production and reception of dance, shifting constructions of bodies and movement, theories of dance reconstruction, and conceptualizations of historical evidence.

DNCE 257 Rhetorical Approaches to Dance Studies 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): reading knowledge of a language other than English; graduate standing or consent of instructor. The study of dance structure and of the structure of dance study. May include the analysis of narrative or representational structures in dance; narrative structures in dance writing; dance semiotics; dance philosophy; and the accuracy, reliability, and value of critical studies of dance.

DNCE 258 Cultural Approaches to Dance Studies 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): reading knowledge of a language other than English; graduate standing or consent of instructor. The study of dance in and across cultures including cross-cultural studies of dance; multicultural approaches to dance history; ethnological, ethnographic, and cultural studies approaches to dance analysis; and analysis of the different roles and functions dance plays in cultural systems.

DNCE 260 Special Topics in Critical Dance Studies 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Examines issues in the field of critical dance studies. Course is repeatable.

DNCE 264 Oral History and Ethnographic Methods 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Theory and practice of oral history and ethnography as research techniques. Cultural and political perspectives on oral history and ethnography; methods for research preparation, interview procedures, transcription, editing, and legal responsibilities. Ethnographic and/or interview project and analytical paper required.

DNCE 267 Choreographies of Writing 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An analysis of the types of relationships that may exist between dance and text. Examines the methods and strategies for translating choreographed action into a written description of that action. Students' writing is a major focus of discussions.

DNCE 280 Colloquium in Current Topics in Dance Research 4 Colloquium, 2 hours; extra reading, 2 hours; written work, 1 hour; practicum, 1 hour; research, 1 hour; screening, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Presents current research topics in dance, including selected professional development workshops. Conducted by students, faculty, visiting scholars, and artists. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory(S) or No Credit(NC) grade. Course is repeatable to a maximum of 8 units.

DNCE 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and Department Chair To be taken to meet special curricular problems. Normally graded Satisfactory (S) or No Credit (NC) only, but students may petition the instructor for a letter grade for specialized topics pursued with close faculty supervision. Course is repeatable.

DNCE 291 Individual Study in Coordinated Areas 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. A program of study designed to advise and assist graduate students who are preparing for written and oral qualifying examinations. Does not count toward the unit requirement for the Ph.D. degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

DNCE 292 Concurrent Analytical Studies in Dance 1 to 4 Research, 3 to 12 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. To be taken concurrently with some 100-series course, but on an individual basis. Limited to research, criticism, and written work of a graduate order commensurate with the number of units elected. Normally graded Satisfactory (S) or No Credit (NC) only, but students may petition the instructor for a letter grade for specialized topics pursued with close faculty supervision. Course is repeatable.

DNCE 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): consent of instructor and graduate advisor. Individualized studies in specially selected topics in Dance under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

DNCE 298I Individual Internship 1 to 4 Internship, 3 to 12 hours; term paper, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Individual study or apprenticeship with an appropriate professional individual or organization to gain experience and skill in activities related to dance studies. Graded Satisfactory (S) or No Credit (NC). Course is repeatable for a maximum of 12 units.

DNCE 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): consent of thesis or dissertation director. Research for and preparation of the thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

DNCE 301 Seminar in Dance Studies Pedagogy and Professional Development 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Prepares for the teaching of dance studies in an academic setting and for participating in the dance studies profession. Includes creating course syllabi, discussing a range of practical teaching and professionalization issues, and developing skills necessary to succeed in the academic field of dance. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

DNCE 302 Teaching Practicum 1 to 4 Lecture, 1 4o 4 hours. Prerequisite(s): graduate standing. Supervised teaching in upper-division Dance History and lower-division Dance courses. Must be taken at least once by all teaching assistants. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Data Science

Subject abbreviation: DTSE
The Marlan and Rosemary Bourns College of Engineering

Subject abbreviation: DTSC
The College of Natural and Agricultural Sciences

Jun Li, Ph.D., Director
Vassilis Tsotras, Ph.D., Associate Director

Program Steering Committee:
Yingzhuo (Joyce) Fu, Ph.D., Statistics
Jun Li, Ph.D., Statistics
Wenxiu Ma, Ph.D., Statistics
Vagelis Papalexakis, Ph.D., Computer Science and Engineering
Mariam Salloum, Ph.D., Computer Science and Engineering
Christian Shelton, Ph.D., Computer Science and Engineering
Vassilis Tsotras, Ph.D., Computer Science and Engineering
Shuheng Zhou, Ph.D., Statistics

Major

Data science studies the collection, management, and analysis of data to extract knowledge. It is a multidisciplinary program with core components from Computer Science and Statistics, and required application study in a variety of empirical disciplines. Courses span the discipline from theory to practice and prepare students for careers or graduate studies in data-intensive fields.

The B.S. in Data Science major is an intercollege major offered by the Marlan and Rosemary Bourns College of Engineering and the College of Natural and Agricultural Sciences. A B.S. degree in Data Science is offered by each college. When students declare the major, they choose from which college they wish to have their degree awarded. Students whose degrees are awarded by the Marlan and Rosemary Bourns College of Engineering are advised in and have their records maintained by the BCOE Office of Student Academic Affairs; students whose degrees are awarded by the College of Natural and Agricultural Sciences are advised in and have their records maintained by the CNAS Undergraduate Academic Advising Center. Breadth requirements vary by college; and students must fulfill the breadth requirements of the college they choose.

All undergraduates in the Marlan and Rosemary Bourns College of Engineering must see an advisor at least annually. Visit student.engr.ucr.edu for details.

University Requirements

See Undergraduate Students section.

College Requirements

College breadth requirements vary depending on which college is chosen to award the degree. For details on breath requirements, see the Colleges and Programs section of this catalog. Students are encouraged to consult their advisor regarding requirements.

Transfer Admissions Requirements of Data Science Major

Minimum 2.80 cumulative GPA

Minimum 2.70 GPA in the calculus series

Minimum 2.5 in one of the following series:

1. Three courses either from the set CS 010A, 010B, 010C, CS/MATH 011, or from the set CS 009A, 009B, 010C, CS/MATH 011
2. MATH 010A, MATH 031, STAT 008

Minimum Preparation for Data Science:

1. (CS 010A and CS 010B) or (CS 009A and CS 009B)
3. MATH 009A or MATH 09HA, MATH 009B or MATH 09HB, MATH 009C or MATH 09HC

Must complete three of the following:

1. CS010C
2. CS/MATH 011
3. MATH 031
4. MATH 010A
5. STAT 008 or STAT 010

Change of Major Criteria for the BCOE track

All students who request a change of major to Data Science in BCOE must meet the following requirements:

- Be in good academic standing
- Have no less than a C- in any Statistics, Math, Science and Engineering Coursework
- Be able to complete the major within maximum allowable units
- Complete all the courses listed below, based on the total number of units earned, prior to submitting the major change request
- UCR transfer students interested in changing to a BCOE major must have been admissible to the major at point of entry, or must satisfy transfer admission and change of major requirements before earning 120 units
- If changing in the 90-119 units category, student must have the ability to complete major within 5 years of entry as a Freshmen or 3 years after entry as a Transfer student.
- Students who have earned 120 or more units are not eligible for a change of major in BCOE. NOTE: AP/IB units are excluded from maximum unit calculation.

Completed 0 to less than 45 units
Completion of ENGL 001A with C or better, and completion of the following with at least 2.70 GPA:

- (CS 010A and CS 010B) or (CS 009A and CS 009B)
- MATH 007A or MATH 009A or MATH 09HA (MATH 009A is strongly recommended)

Completed 45 to less than 90 units
Completion of ENGL 001A with C or better, and completion of the following with at least 2.70 GPA:

- (CS 010A and CS 010B) or (CS 009A and CS 009B)
- MATH 007A or MATH 009A or MATH 09HA (MATH 009A is strongly recommended)
- MATH 007B or MATH 009B or MATH 09HB (MATH 009B is strongly recommended)
- MATH 009C or MATH 09HC

An introductory statistics course (STAT 010 or equivalent) is recommended.

Completed 90 to less than 120 units
Completion of ENGL 001A and ENGL 001B with C or better, and completion of the following with at least 2.70 GPA:

- (CS 010A and CS 010B) or (CS 009A and CS 009B and CS 009C)
- CS 010C
- MATH 011/CS 011
- MATH 007A or MATH 009A or MATH 09HA (MATH 009A is strongly recommended)
- MATH 007B or MATH 009B or MATH09HB (MATH 009B is strongly recommended)
- MATH 009C or MATH 09HC
- One of MATH 031 or MATH 010A

An introductory statistics course (STAT 010 or equivalent) is recommended.

Change of Major Criteria for the CNAS track

All students who request a change of major to Data Science in CNAS must meet the following requirements:

- Be in good academic standing
- Have no less than a C- in any Statistics, Math, Science and Engineering coursework
- Be able to complete the major within maximum allowable units
- Complete all the courses listed below, based on the total number of units earned, prior to submitting the major change request
- UCR transfer students interested in changing to a CNAS major must have been admissible to the major at point of entry, or must satisfy transfer admission and change of major requirements before earning 135 units
- Changing to the Data Science Major at senior level (greater than or equal to 135 units) is not allowed

Completed 0 to less than 45 units
Completion of ENGL 001A with C or better, and completion of the following with at least 2.70 GPA:

- (CS 010A and CS 010B) or (CS 009A and CS 009B)
- MATH 007A or MATH 009A or MATH 09HA (MATH 009A is strongly recommended)

Completed 45 to less than 90 units
Completion of ENGL 001A with C or better, and completion of the following with at least 2.70 GPA:

- (CS 010A and CS 010B) or (CS 009A and CS 009B)

- MATH 007A or MATH 009A or MATH 09HA (MATH 009A is strongly recommended)
- MATH 007B or MATH 009B or MATH 09HB (MATH 009B is strongly recommended)
- MATH 009C or MATH 09HC

An introductory statistics course (STAT 010 or equivalent) is recommended.

Completed 90 to less than 135 units
Completion of ENGL 001A and ENGL 001B with C or better, and completion of the following with at least 2.70 GPA:

- (CS 010A and CS 010B) or (CS 009A and CS 009B and CS 009C)
- CS 010C
- MATH 011/CS 011
- MATH 007A or MATH 009A or MATH 09HA (MATH 009A is strongly recommended)
- MATH 007B or MATH 009B or MATH 09HB (MATH 009B is strongly recommended)
- MATH 009C or MATH 09HC
- One of MATH 031 or MATH 010A

An introductory statistics course (STAT 010 or equivalent) is recommended.

Major Requirements

1. Lower-division requirements (47-54 units):
   a) (CS 010A, CS 010B, CS 010C) or (CS 009A, CS 009B, CS 009C*, CS 010C)
   b) One math sequence from the following:
      i. MATH 007A or MATH 009A or MATH 009HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC
      ii. MATH 005A, MATH 005B, MATH 005C
   c) MATH 010A, MATH 031
   d) MATH 011/CS 011
   e) STAT 010, STAT 011
2. Upper-division requirements (60 units):
   a) CS 105, CS 141
   b) STAT 107, STAT 156A, STAT 156B, STAT 169, STAT 170
   c) CS 108/STAT 108
   d) CS 166 or CS 167
   e) STAT 167 or CS 171/EE 142
   f) STAT 183 or CS 179 (E-Z)
   g) Four courses (at least 16 units) from the following list, none of which can also be used to satisfy other major requirements: CS 131, CS 144, CS 166, CS 167, CS 170, CS 172, CS 173, CS 180, CS 181, MATH 120, MATH 135A, BUS/STAT 104, BUS/STAT 127, STAT 130, STAT 140, STAT 146, STAT 157, STAT 171.
3. Major Breadth requirement (8 units)
   One two-course sequence, chosen from the course sequences listed below:
   i. BIOL 005B, BIOL 005C
   ii. BIOL 005B, BIOL 102
   iii. BUS 103 and BUS 115
   iv. BUS 103 and BUS 119
   v. BUS 105 and BUS 129
   vi. ECON 108 and ECON 136
   vii. EE 144/ME 144 and one of: EE 106 or EE 146 or EE148
   viii. GEO 111 and GEO 161
   ix. GEO 115 and GEO 147

Note
CS 100 and CS 111 are strongly recommended.

(*) If the CS009A, CS009B, CS 009C, CS010C sequence is used, the lower division requirements become 49 units.

Minor

The Data Science minor is designed to provide students with practical knowledge of the concepts and techniques used in data analysis, including statistical methodology, data-oriented computing, and data ethics. The minor will provide students from a wide array of majors with the foundational skills to design, implement, and think critically about inferential analysis within their respective disciplines. Students with majors in Computer Science, Computer Science with Business Applications, Computer Engineering, Data Science, and Statistics are not eligible.

The following are the requirements for the Data Science minor.

1. Lower-division requirements (25-28 units):
   a) CS 009A, CS 009B
   b) One math sequence from the following:
      (i) MATH 009A or MATH 09HA, MATH 009B or MATH 09HB, MATH 009C or MATH 09HC
      (ii) MATH 005A, MATH 005B, MATH 005C
   c) STAT 008 or STAT 010
2. Upper-division requirements (20 units):
   a) CS 105
   b) STAT 156A
   c) CS 108/STAT 108
   d) Eight (8) units of the upper-division courses selected from the list below: CS 100, CS 166, CS 167, CS 170, CS 171, CS 172, STAT 107, STAT 130, STAT 140, STAT 146, STAT 156B, STAT 167

No more than 4 units may be in courses numbered 190 through 199.

Completion of CS 009A and CS 009B with a C- or better and completion of the minor requirements with at least 2.700 GPA.

Data Science, Computational

Subject abbreviation: CPDS
The Marlan and Rosemary Bourns College of Engineering

Vassilis Tsotras, Ph.D., Director
datascience.ucr.edu/graduate/computational-data-science

Program Faculty
Salman Asif, Ph.D. (Electrical and Computer Engineering)
Bir Bhanu, Ph.D. (Electrical and Computer Engineering)
Jia Chen, Ph.D. (Electrical and Computer Engineering)
Evangelos Christidis, Ph.D. (Computer Science and Engineering)
Yue Dong, Ph.D. (Computer Science and Engineering)
Ahmed Eldawy, Ph.D. (Computer Science and Engineering)
Basak Guler, Ph.D. (Electrical and Computer Engineering)
Eamonn Keogh, Ph.D. (Computer Science and Engineering)
Paea LePendu, Ph.D. (Computer Science and Engineering)
Amr Magdy, Ph.D. (Computer Science and Engineering)
Evangelos Papalexakis, Ph.D. (Computer Science and Engineering)
Chinya Ravishankar, Ph.D. (Computer Science and Engineering)
Amit Roy-Chowdhury, Ph.D. (Electrical and Computer Engineering)
Elaheh Sadredini, Ph.D. (Computer Science and Engineering)
Mariam Salloum, Ph.D. (Computer Science and Engineering)
Christian Shelton, Ph.D. (Computer Science and Engineering)
Vassilis Tsotras, Ph.D. (Computer Science and Engineering)
Ertem Tuncel, Ph.D. (Electrical and Computer Engineering)
Greg Ver Steeg, Ph.D. (Computer Science and Engineering)
Neftali Watkinson, Ph.D. (Computer Science and Engineering)
Nanpeng Yu, Ph.D. (Electrical and Computer Engineering)

Master's Degree

M.S. in Computational Data Science

The Marlan and Rosemary Bourns College of Engineering offers an M.S. program in Computational Data Science.

Admission
All applicants to this program must have completed a bachelor's degree or its approved equivalent from an accredited institution and to have attained undergraduate record that satisfies the standards established by the Graduate Division and University Graduate Council. Applicants must supply GRE General Test scores. Applicants whose first language is not English are required to submit acceptable scores from the TEST of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) unless they have a degree from an institution where English is the exclusive language of instruction. Additionally, each applicant must submit letters of recommendation, as per the admission requirements. All other application requirements are specified in the graduate application.

Prerequisite Material
Applicants need experience in programming, software engineering, algorithms, and background in statistics. Competence in these areas is defined by the following UCR undergraduate courses (or equivalents):

CS 141, CS 100, MATH 010A, MATH 031, as well a course covering foundations of probability and statistics (like STAT 155 or EE 114)

Applicants who fail to meet this criterion may sometimes be admitted with course deficiencies, provided they take remedial steps to cover the deficiencies. A student who is deficient in a competency area may be asked to complete the

corresponding UCR course with a letter grade of at least B, or to pass a challenge examination based on that course's final exam with a grade of at least B. All such remedial work cannot be counted towards the MS degree requirements and should be completed within the first year of graduate study, and in all cases the deficiency(s) must be corrected BEFORE a student can enroll in any graduate course from the same specialty area. The details will be decided by the Graduate Advisor of the program in consultation with the student.

Course Work

The M.S. in Computational Data Science requires the completion of 49 units of coursework, including a capstone project. There are no thesis or comprehensive exam options.

The coursework consists of 5 core courses, 6 elective courses, a professional development course and the capstone course. Elective courses are selected by the student from a list of possible courses; students can petition to select a course not on the list. Students who have completed similar courses elsewhere may petition for waiver of a required course or for substitution of an alternative course.

Core Courses (20 units):
All students must complete the same core courses.

- CS 252A/EE 251A – Data Analytics and Exploration
- CS 252B/EE 251B – Fundamentals of Data Science or CS 224/EE242A – Fundamentals of Machine Learning
- CS 226 – Big-Data Management or CS 236 – Database Management Systems
- CS 235 – Data Mining Techniques
- CS 212/STAT 212 – Data Science Ethics

Elective Courses (24 units):
The six electives must be selected from the following two lists of elective courses where at least four courses must be from list A. Students may petition for other elective courses; such petitions require approval from the program's graduate advisor. Courses used to satisfy the Core Courses requirements may not be used to satisfy the Elective Courses requirements.

Elective List A:
CS 205, CS222, CS 225, CS226 or CS236, CS 227, CS/EE 228, CS 229/EE242B, CS 242, CS/EE 248, EE227/CS258, EE 231, EE 236, EE240, EE 244, EE 268, EE 269

Elective List B:
CS 210, CS 211, CS/EE 217, CS 234, EE 241, EE 243, EE 250, EE 267

Professional Development Requirement
Students will satisfy the professional development requirement by enrolling in one of the following courses: one quarter of CS 287, or GDIV 403, or at least one unit of CS 298I.

Capstone Experience
Students must complete CS/EE 279 under the guidance of the capstone instructor member.

Normative Time to Degree
Six quarters (2 years).

Earth and Planetary Sciences

Subject abbreviation: GEO
College of Natural and Agricultural Sciences

Robert J. Allen, Ph.D., Chair
Department Office: 462 Geology Building
(951) 827-4870; epsci.ucr.edu

Anthony Dominguez,
Graduate Student Services Advisor
Office: Batchelor Hall, 1140
(951) 827-0171

CNAS Undergraduate Academic Advising Center, 1223 Pierce Hall
cnasstudent.ucr.edu

Professors

Robert J. Allen, Ph.D.
Andrey Bekker, Ph.D.
Mary L. Droser, Ph.D., *Distinguished Professor*
Gareth J. Funning, Ph.D.
Abhijit Ghosh, Ph.D.
Stephen R. Kane, Ph.D.
Gordon D. Love, Ph.D.
Timothy W. Lyons, Ph.D., *Distinguished Professor*
Richard A. Minnich, Ph.D.
David D. Oglesby, Ph.D.
Andrew Ridgwell, Ph.D.
Peter M. Sadler, Ph.D.

Professors Emeriti

James H. Dieterich, Ph.D.
Wilfred A. Elders, Ph.D.
Tien-Chang Lee, Ph.D.
Michael A. McKibben, Ph.D.
Michael A. Murphy, Ph.D.
Stephen K. Park, Ph.D.
Michael O. Woodburne, Ph.D.

Associate Professors

Nicolas Barth, Ph.D
Maryjo N. Brounce, Ph.D.
Roby Douilly, Ph. D.
Heather Ford, Ph.D.
Sandra Kirtland Turner, Ph.D.
Wei Liu, Ph.D.
Edward W. Schwieterman Ph.D.

Assistant Professors

Eric Barefoot, Ph.D.
Karma Nanglu, Ph.D.
Joana Voigt, Ph.D.

Adjunct Professor

Larissa F. Dobrzhinetskaya, Ph.D.

Adjunct Assistant Professors

Elizabeth Cochran, Ph.D.
Katherine J. Kendrick, Ph.D.
Thomas A. Scott, Ph.D.

Majors

The Department of Earth and Planetary Sciences offers B.S. degrees in Earth and Planetary Sciences, Geology and Geophysics. These degree programs are designed for students with a strong interest in acquiring academic understanding and relevant vocational training in the Earth and Planetary Sciences, and for students interested in secondary teaching with a science emphasis. The B.S. programs include fieldwork with field courses, and field trips in all appropriate courses.

Academic Advising

Undergraduate advising in the Department of Earth and Planetary Sciences is designed to allow close professional contact with faculty and staff. Counseling on graduation, departmental requirements and enrollment is handled by the major's professional academic advisors housed in the CNAS Undergraduate Academic Advising Center and the faculty undergraduate advisor for each major.

Faculty undergraduate advisors counsel students on career goals and research opportunities. The department recommends that students meet with their faculty advisor at least once each quarter to clarify career objectives and revise the program of study so it is commensurate with the developing interests and objectives of the student.

Teaching Credential

Teachers in the public schools in California must have a credential approved by the State Commission on Teacher Credentialing. The credential requires an undergraduate major, baccalaureate degree, and completion of a graduate credential program such as that offered by the School of Education at UCR.

Before admission and student teaching in a graduate credential program, the candidate must pass the California Basic Education Skills Test (CBEST) and demonstrate subject-matter proficiency by passing an examination. All candidates for a multiple subject credential to teach in the elementary grades must pass the Multiple Subjects, California Subject Exam for Teachers (CSET). Students are urged to start early, preferably as freshmen, selecting courses most helpful for this career. Details and counseling on the Prepare to Teach Program, a program for the multiple subject credential, are available in the Office of Interdisciplinary Programs, 2417 Humanities and Social Sciences, (951) 827-2743. Details and counseling on other programs are available in the Department of Earth and Planetary Sciences or the School of Education.

UCR does not yet have a state-approved subject matter undergraduate program for earth and planetary sciences majors who wish to teach at the secondary level. The Teaching Credential in Science, geoscience authorization, is required for teachers who want to teach earth science/geoscience in middle school and high school. Students who plan to get this credential must take the CSET exams in Geosciences and should make certain their academic program includes preparatory course work. The examination includes geoscience in depth and general science with introductory, college-level biology, chemistry, physics, and geoscience (geology, meteorology, oceanography, astronomy). CSET test guides are available at cset.nesinc.com.

Further information about courses, requirements, and examinations can be obtained in orientation meetings, the CalTeach-SMI Office (1114 Pierce Hall) and the School of Education (1124 Sproul Hall).

Earth and Planetary Sciences students interested in a secondary school science teaching career, who intend to obtain a Teaching Credential in Science, geoscience authorization, should pursue both the B.S. in Earth and Planetary Sciences or in Geology as well as the teaching credential from the School of Education. Students who want to have the option to become either a professional geoscientist or to teach earth science in secondary school should pursue the B.S. in Geology as well as the teaching credential from the School of Education.

Students in CNAS who intend to pursue a Teaching Credential in Science, with authorization in another science, should consider pursuing a minor within Earth and Planetary Sciences.

Earth and Planetary Sciences Major

Students who choose Earth and Planetary Sciences Major study the past, present, and future of our Earth through the interdisciplinary study of its various systems. Earth and Planetary Sciences majors choose between concentrations in Geosystems, Climate Change, Geobiology, Geophysics, and Planetary Sciences, which are explored from a combination of lab-based, field-based, and computational perspectives.

Geology Major

Students who choose the Geology major study the structure, composition, processes, and history of the Earth. In particular, the Geology major stresses features of the Earth's surface and interactions between its atmosphere, hydrosphere, biosphere, rocky crust, and interior. Through an emphasis on developing important skills, one of the goals of this program is to prepare students for Geology careers in the public, private, and academic sectors.

Geophysics Major

Students who choose the Geophysics major apply the principles and concepts of physics, mathematics, geology, and engineering to the study of the physical characteristics of the earth and other planets. They make measurements of gravity and magnetic fields, seismic waves, temperatures, and natural electric current. Geophysicists study these topics from the standpoint of the physics of solid bodies, gases, and fluids. Some geophysicists are field oriented, some laboratory oriented, some theoretical, and some combine these areas.

Change of Major and Continuation Criteria

Students wishing to change into or continue in the **Earth and Planetary Sciences** major must be in good academic standing and show potential to graduate without exceeding 216 units.

Freshmen (2nd and 3rd quarter) must demonstrate progress in basic sciences and aptitude for Earth and Planetary Sciences by satisfying the following three criteria by Spring Quarter or Summer Session:

- MATH 007B or MATH 009B eligible (e.g. completion of MATH 007A or MATH 009A with grades of C- or better)
- CHEM 01B eligible (e.g. completion of CHEM 01A with a grade of C- or better
- One of GEO 001, GEO 002 or GEO 009

  or

  GEO 011, or GEO 003 completed with a grade of C- or better

Sophomores (up to 89.9 cumulative units) must demonstrate sustained progress in basic sciences and aptitude for geology by satisfying the following three criteria by Spring Quarter or Summer Session:

- CHEM 001B completed with passing grades
- MATH 009C or MATH 046 eligible (e.g. MATH 007B or MATH 009B with grade of C- or better)
- Two of GEO 001, GEO 002 or GEO 009

  or

- GEO 011, or GEO 003 completed with no grade below C- after repeats

Juniors (90 – 134.9 units) must demonstrate near completion of basic sciences and aptitude for upper-division Earth and Planetary Sciences by satisfying the following three criteria by Spring Quarter or Summer Session:

- CHEM 001B and MATH 009C or MATH 046 completed with passing grades
- PHYS 040B or PHYS 002B and PHYS 002LB eligible (i.e. completion of one quarter of college physics with C- or better)
- GEO 001, GEO 002 or GEO 009 or GEO 011, GEO 003, GEO 111, and GEO 115 or GEO 157 (and all prerequisites) completed with no grade below C- after repeats

Seniors (135+ units): must have completed all but 1 course of the Earth and Planetary Sciences core requirements by Spring Quarter or Summer Session, as follows:

- CHEM 001B, MATH 009C or MATH 046, PHYS 040B or PHYS 002B and PHYS 02LB completed with passing grades.
- BIOL 002 or BIOL 005A and BIOL 05LA or BIOL 020, completed with passing grades.
- GEO 001, GEO 002 or GEO 009 or GEO 011, GEO 003, GEO 004 or GEO 007 or GEO 008 or GEO 010 or GEO 012, GEO 111, GEO 115, and GEO 157 (and all prerequisites) completed with no grade below C- after repeats.

Students wishing to change into or continue in the **Geology** major must be in good academic standing and show potential to graduate without exceeding 216 units.

Freshmen (2nd and 3rd quarter) must demonstrate progress in basic sciences and aptitude for geology by satisfying the following three criteria by Spring Quarter or Summer Session:

- MATH 009B eligible (e.g. completion of MATH 007A or MATH 009A with grades of C- or better)
- CHEM 001B eligible (e.g. completion of CHEM 01A with a grade of C- or better
- One of GEO 001, GEO 002, or GEO 003 completed with a grade of C- or better

Sophomores (up to 89.9 cumulative units) must demonstrate sustained progress in basic sciences and aptitude for geology by satisfying the following three criteria by Spring Quarter or Summer Session:

- CHEM 001B completed with passing grades
- MATH 009C or MATH 046 eligible (e.g. MATH 007B or MATH 009B with grade of C- or better)
- Two of GEO 001, GEO 002, or GEO 003 completed with no grade below C- after repeats

Juniors (90 – 134.9 units) must demonstrate near completion of basic sciences and aptitude for upper-division geology by satisfying the following three criteria by Spring Quarter or Summer Session:

- CHEM 001B and MATH 009C or MATH 046 completed with passing grades
- PHYS 040B or PHYS 002B and PHYS 002LB eligible (i.e. completion of one quarter of college physics with C- or better)
- GEO 002, GEO 003, GEO 111, GEO 115 or GEO 122 (and all prerequisites) completed with no grade below C- after repeats

Seniors (135+ units): must have completed all but 1 course of the geology core requirements by Spring Quarter or Summer Session, as follows:

- CHEM 001B, MATH 009C or MATH 046 and PHYS 040B or PHYS 002B and PHYS 02LB completed with passing grades.
- BIOL 002 or BIOL 005A and BIOL 05LA or BIOL 020, completed with passing grades.
- GEO 001, GEO 002, GEO 003, GEO 111, GEO115, GEO 116 and GEO 122 and GEO 101 or GEO 118 (and all prerequisites) completed with no grade below C- after repeats.

Transfer Selection Criteria

Applicants to majors in the College of Natural and Agricultural Sciences are selected on the basis of academic preparation, as assessed by their GPA and the strength of preparation for the intended major. A GPA of at least 2.70 is required. (This is a baseline GPA for consideration and not a guarantee of admission.)

In addition, applicants will need to complete college courses comparable to at least two of the following UCR year-long sequences in order to meet selection criteria for this major. Courses must be completed with "C" grades or better:

MATH 007A or MATH 009A, MATH 007B or MATH 009B, and MATH 009C or MATH 046 (mandatory)

And at least one sequence from:

1. BIOL 005A, BIOL 05LA or BIOL 020 and BIOL 005B (and BIOL 005C, if articulated)
2. CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB
3. PHYS 040A and PHYS 040B or PHYS 002A and PHYS 002B
4. MATH 010A, MATH 010B, and MATH 046

Courses must be completed with a letter grade, with no grade lower than a "C." Students should visit assist.org for updated and comprehensive major preparation requirements.

Any applicant not meeting the above math course requirements may still be considered for possible admission by exception.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

Major Requirements

Earth and Planetary Sciences Major

All courses in Geosciences that are prerequisites for other courses in the major must be passed with a grade of "C-" or better before proceeding in the sequence. For example, GEO 001 is a prerequisite for GEO122.

The department offers five concentrations to majors in Earth and Planetary Sciences: Geosystems, Climate Change, Geobiology, Geophysics, and Planetary Sciences. All students majoring in Earth and Planetary Sciences are normally required to take the core curriculum.

Geosystems, Climate Change, Geobiology, Geophysics, and Planetary Sciences Concentrations

Core Requirements (61-66 units)

1. **Lower division core requirements (48-53 units)**
   a) GEO 001
   b) GEO 002 or GEO 009 or GEO 011
   c) GEO 003/BIOL 010
   d) GEO 004 or GEO 007 or GEO 008 or GEO 010 or GEO 012 or GEO 013 or GEO 080
   e) BIOL 005A and BIOL 005LA or BIOL 020
   f) Either CHEM 001A and CHEM 01LA or CHEM 01HA and CHEM 1HLA, either CHEM 001B and CHEM 01LB or CHEM 01HB and CHEM 01HLB
   g) MATH 007A or MATH 009A, MATH 007B or MATH 009B, MATH 046
   h) Either PHYS 040A, PHYS 040B or PHYS 002A and PHYS 002LA, PHYS 002B and PHYS 002LB Students interested in elective classes in Geophysics are recommended to take PHYS 040C or PHYS 002C. Students interested in elective classes in Geochemistry are recommended to take CHEM 001C.
2. **Upper division core requirements (13 units)**
   a) GEO 111, GEO 115, GEO 157

Geosystems Concentration

1. **Upper division requirements (35–38 units)**
   a) GEO 101A, GEO 101B, GEO 118
   b) Three of GEO 100, GEO 116, GEO 122, GEO 132, GEO 151, GEO 152, GEO 162
   c) Three of GEO 100, GEO 116, GEO 122, GEO 132, GEO 136, GEO 137, GEO 138, GEO 140, GEO 144, GEO 145, GEO 147, GEO 151, GEO 152, GEO 160, GEO 161, GEO 162, GEO 163, GEO 169, GEO 180, GEO 181, GEO 182, GEO 184, STAT 155

Students interested in pursuing professional licensure through the California Geologist In Training (GIT) are advised to take the Geology Major.

Climate Change Concentration

1. **Lower division requirements (5 units)**
   a) CHEM 001C and CHEM 001LC, or CHEM 001HC and CHEM 001HLC
2. **Upper division requirements (32–36 units)**
   a) GEO 160, GEO 161, GEO 163
   b) Three of GEO 136, GEO 137, GEO 162, ENSC 102
   c) Three of GEO 100, GEO 116, GEO 118, GEO 122, GEO 132, GEO 136, GEO 137, GEO 140, GEO 144, GEO 145, GEO 147, GEO 151, GEO 152, GEO 162, GEO 169, GEO 180, GEO 181, GEO 182, GEO 184, STAT 155

   or

   GEO 101A and GEO 101B, and two of GEO 100, GEO 116, GEO 118, GEO 122, GEO 132, GEO 136, GEO 137, GEO 140, GEO 144, GEO 145, GEO 147, GEO 151, GEO 152, GEO 162, GEO 169, GEO 180, GEO 181, GEO 182, GEO 184, STAT 155

Geobiology Concentration

1. **Lower division requirements (8 units)**
   a) BIOL 005B, BIOL 005C
2. **Upper division requirements (32–37 units)**
   a) GEO 151 and GEO 152/BIOL 152
   b) Three of GEO 136, GEO 137, GEO 161, GEO 169, ENTM/BPSC/BIOL 112, BIOL 151
   c) Three of GEO 100, GEO 116, GEO 118, GEO 122, GEO 132, GEO 136, GEO 137, GEO 140, GEO 144, GEO 145, GEO 147, GEO 160, GEO 161, GEO 162, GEO 163, GEO 169, GEO 180, GEO 181, GEO 182, STAT 155

   or

   GEO 101A and GEO 101B, and two of GEO 100, GEO 116, GEO 118, GEO 122, GEO 132, GEO 136, GEO 137, GEO 140, GEO 144, GEO 145, GEO 147, GEO 160, GEO 161, GEO 162, GEO 163, GEO 169, GEO 180, GEO 181, GEO 182, STAT 155

Geophysics Concentration

1. **Lower division requirements (5 units)**
   a) PHYS 002C and PHYS 002LC, or PHYS 040C
2. **Upper division requirements (34-38 units)**
   a) GEO 140, GEO 145
   b) Three of GEO 116, GEO 118, GEO 144, GEO 147
   c) Three of GEO 100, GEO 116, GEO 118, GEO 122, GEO 132, GEO 136, GEO 137, GEO 144, GEO 147, GEO 151, GEO 152, GEO 160, GEO 161, GEO 162, GEO 163, GEO 169, GEO 180, GEO 181, GEO 184, STAT 155

   or

   GEO 101A and GEO 101B, and two of GEO 100, GEO 116, GEO 118, GEO 122, GEO 132, GEO 136, GEO 137, GEO 144, GEO 147, GEO 151, GEO 152, GEO 160, GEO 161, GEO 162, GEO 163, GEO 169, GEO 180, GEO 181, GEO 184, STAT 155

Planetary Sciences Concentration

1. **Lower division requirements (5 units)**
   a) PHYS 002C and PHYS 002LC, or PHYS 040C
2. **Upper division requirements (32-35 units)**
   a) Four of GEO 180, GEO 181, GEO 182, GEO 184, PHYS 111
   b) Four of GEO 100, GEO 116, GEO 122, GEO 132, GEO 136, GEO 137, GEO 138, GEO 140, GEO 144, GEO 145, GEO 147, GEO 151, GEO 152, GEO 160, GEO 161, GEO 162, GEO 163, GEO 169

Geology Major

All courses in Geosciences that are prerequisites for other courses in the major must be passed with a grade of "C-" or better before proceeding in the sequence. For example, GEO 001 is a prerequisite for GEO 122.

All students majoring in Geology are normally required to take the core curriculum.

1. **Lower-division requirements (43-44 units)**
   a) GEO 001, GEO 002 or GEO 009 or GEO 011, GEO 003/BIOL 010
   b) BIOL 002 or BIOL 005A, BIOL 05LA (or BIOL 020)
   c) Either CHEM 001A and CHEM 01LA or CHEM 01HA and CHEM 1HLA, either CHEM 001B and CHEM 01LB or CHEM 01HB and CHEM 01HLB
   d) MATH 007A or MATH 009A or MATH 009HA, MATH 007B or MATH 009B or MATH 009HB, MATH 046
   e) PHYS 040A, PHYS 040B or PHYS 002A and PHYS 02LA, PHYS 002B and PHYS 02LB

Students interested in elective classes in Geophysics are recommended to take PHYS 040C (if they have previously taken PHYS 040A and PHYS 040B), or PHYS 002C and 02LC (if they have previously taken PHYS 002A and PHYS 02LA and PHYS 002B and 02LB). Students interested in elective classes in Geochemistry are recommended to take CHEM 001C and CHEM 01LC.

2. **Upper-division requirements (52-54 units)**
   a) GEO 100, GEO 101A, GEO 101B, GEO 102A, GEO 102B, GEO 111, GEO 115, GEO 116, GEO 118, GEO 122
   b) Two of GEO 123, GEO 124, GEO 132, GEO 136, GEO 137, GEO 140 GEO 144, GEO 145, GEO 147 GEO 151, GEO 152, GEO 157, GEO 160, GEO 161, GEO 162, GEO 163, GEO 169, GEO 180, GEO 181, GEO 182, GEO 184, STAT 155

Students interested in pursuing professional licensure through the California Geologist In Training (GIT) examination should consider taking GEO 132 and GEO 162 as their elective classes

Geophysics Major

The following are major requirements for the B.S. in Geophysics. All students majoring in Geophysics are normally required to take this core curriculum.

1. **Lower-division requirements (52-66 units)**
   a) GEO 001 and one of GEO 004 or GEO 008
   b) MATH 007A or MATH 009A or MATH 009HA, MATH 007B or MATH 009B or MATH 009HB, MATH009C, MATH 010A, MATH 031, MATH 046
   c) PHYS 040A, PHYS 040B, PHYS 040C (strongly recommended), or PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB, PHYS 002C, PHYS 02LC
   d) CS 009M or CS 009P or CS 010A

CHEM 001A, CHEM 001LA, CHEM 001B, CHEM 001LB, MATH 010B are recommended as prerequisites for upper division electives in geology and geophysics, and for students looking to earn a teaching credential for high school science.

2. **Upper-division requirements (46-52 units)**
   a) GEO 111, GEO 115, GEO 116, GEO 140, GEO 145
   b) One of GEO 144 or GEO 147
   c) Five of GEO 100, GEO 101A, GEO 101B, GEO 118, GEO 122, GEO 132, GEO 144 or GEO 147, GEO 157, PHYS 130A, PHYS 130B, PHYS 132 or PHYS 134, PHYS 135A, PHYS 135B, PHYS 136, PHYS 139L, PHYS 177, MATH 120, MATH 131, MATH 132, MATH 135A, MATH 135B, MATH 146A, MATH 146B, MATH 146C, MATH 147, MATH 149A or STAT 160A, MATH 149B or STAT 160B, or STAT 160C, MATH 168, GEO 163, GEO 180, GEO 181, GEO 184, STAT 155

Students wishing to continue on to graduate school may wish to earn a Minor in Mathematics, Physics, Statistics, or Computer Science, requiring an additional 24 upper division units of study, and/or completion of a Senior Thesis, which includes up to 9 units of independent research.

Minor

Students who wish to Minor in Geology, Geophysics, Global Climate Change or Planetary Sciences must complete 20-28 units of organized upper-division courses in Geosciences. A minimum of 16 of these units must be unique to the minor and cannot be used to satisfy major requirements. To satisfy prerequisites, additional preparatory coursework in Earth and Planetary Sciences and other sciences (Biology, Chemistry, Mathematics, Physics) may be required.

Minor in Geology: GEO 001, GEO 115; plus 15-23 additional upper-division Geosciences units.

Minor in Geophysics: GEO 001; GEO 140; plus 16-24 additional units taken from GEO 115, GEO 116, GEO 132, GEO 144, GEO 145, and GEO 190.

Minor in Global Climate Change: GEO 001 or GEO 002; GEO 011; GEO 160; plus 16-24 additional upper-division Geosciences units.

Minor in Planetary Sciences: GEO 001 or GEO 002 or GEO 006 or GEO 009 or GEO 011; GEO 013 or GEO 080; GEO 180, GEO 181, GEO 182, and GEO 184; plus 4-5 units in any upper-division Geosciences course.

Before submitting a petition for a Minor to the college, students interested in pursuing a Minor in Geology or Geophysics or Global Climate Change or Planetary Sciences must consult with the undergraduate faculty advisor in Earth and Planetary Sciences.

Graduate Programs

The Department of Earth and Planetary Sciences offers the M.S. and Ph.D. in Earth and Planetary Sciences.

Graduate education in the Earth and Planetary Sciences emphasizes all aspects of geology, geophysics and biogeochemistry as applied to understanding the Earth and other planetary bodies. Areas of research include the origin and evolution of life through geological time; astrobiology and the detection and modeling of exoplanets and their atmospheres; the theory, mechanisms and impacts of earthquakes and faulting; observing and modeling current and past climate change; modeling past and future global carbon and other biogeochemical cycles; and geophysical, geochemical and petrological studies of the structure and internal processes of planetary interiors. Integrated field, laboratory and numerical studies are encouraged.

Admission

An undergraduate degree in geology, geochemistry, geophysics or earth/planetary science is the normal preparation for graduate work; however, a degree from a related field of science or engineering or even select non-science disciplines may be appropriate. Applicants to graduate status must supply any standardized test scores required by the Graduate Division before admission.

Master's Degree

In addition to the general requirements listed under the Graduate Studies section of this catalog, the requirements for the M.S. degree in Earth and Planetary Sciences, under the Plan 1 (Thesis), are as follows.

Admission

Students must make up any deficiency in undergraduate preparation required for their area of study. The background required is determined by the graduate advisor in consultation with their faculty advisor. Courses taken to remedy background deficiencies are not applicable to the graduate degree. Such courses are typically designated in the letter of admission to the program sent by the dean of the Graduate Division to the student.

Biannual Reviews

All students must undergo biannual reviews by the departmental Graduate Progress Committee. A student's progress is assessed in these reviews, and the committee may recommend changes in a student's plans after these reviews.

Course Work

All students must enroll each quarter in the Graduate Seminar in Geosciences (GEO 250). Students must attend the weekly Hewett Club lecture series.

Students must complete a minimum of 36 units of course work in the major and related subjects and obtain advance approval of a coherent plan of study from the graduate advisor.

A maximum of 12 upper-division units beyond the requirements for the bachelor's degree may be applied to the 36-unit requirement.

Students must complete a minimum of 12 units of graduate courses, which must include at least four graduate-level instructional courses taught by four different faculty members as approved by the graduate advisor.

All graduate students must complete professional development training by the end of their 9th quarter. This is fulfilled by taking GEO 201 A and GEO 201B before taking their Ph.D. Oral Exam.

Subject to the approval of the graduate advisor, a limited number of upper-division courses in the major and related sciences, if not required for the bachelor's degree and not taken previously, may be accepted for graduate credit.

Thesis and Final Oral Examination

Before the end of the third quarter of study and before embarking on research, the student must submit a written thesis proposal to the graduate progress committee. After approval of the proposal, the student must submit a thesis based on original work for approval by a thesis committee. A maximum of 12 units of thesis research may be counted toward the 36-unit minimum.

Students present an open research seminar as a final oral examination, which is advertised to all the students and faculty in the Earth and Planetary Sciences Department.

Normative Time to Degree

7 quarters

Global Climate and Environmental Change (GCEC)

The GCEC MS track is a field and laboratory based multidisciplinary program focused on the evidence for and controls of past and present climate change. Candidates must complete the following:

Course Work

Students must complete a minimum of 36 quarter units of graduate and upper-division undergraduate courses, and research credit from 1 and 2 (below). Other upper-division undergraduate and graduate classes outside may be substituted with consent of the Graduate Advisor. 24 of 36 credits must be graduate level.

1) Required Core courses: GEO 224 upon entry into the program, GEO 260 and BIOL 212/ENTM 212/GEO 212.
2) At least two additional disciplinary courses: GEO 221, GEO 239, GEO 249, GEO 251, GEO 255, GEO 264, GEO 265, GEO 268, GEO 301, OR ENSC 200, ENSC 218, ENSC 224, ENSC 225, ENSC 232.

Thesis Work
Before the end of the third quarter students must nominate a faculty advisor and identify a thesis topic. Before embarking on research the student must submit a thesis proposal based on original work for approval by a thesis committee. A maximum of 8 units of research credit can be counted toward the 36 unit minimum. Students present an open research seminar as a final oral examination.

Doctoral Degree

The Department of Earth and Planetary Sciences offers the Ph.D. in Earth and Planetary Sciences. In addition to the general University requirements of the Graduate Division as found in the Graduate Studies section of this catalog, the Ph.D. in Earth and Planetary Sciences normally requires the following.

Biannual Reviews
All students meet with the Graduate Progress Committee during their first week at UCR to discuss general interests, goals, and plans. The committee recommends courses designed to prepare a student for research and to correct deficiencies in background. This committee also reviews a student's progress biannually and may recommend transfer to the master's program if normal progress is not maintained.

Course Work
Students must complete at least four graduate-level instructional courses taught by four different faculty members as approved by the graduate advisor. Up to four 100 level classes can count subject to Graduate Advisor approval. Course work used in satisfaction of the M.S. degree may be accepted with the graduate advisor's approval. All students must enroll each quarter in the Graduate Seminar in Geosciences (GEO 250). Students are also required to attend the weekly Hewett Club lecture series.

Written and Oral Qualifying Examinations
The written exam will consist of a written research proposal or proposals as detailed in the Graduate Handbook. The proposal topics must be approved by an examination committee to ensure breadth. The committee reviews the proposals and, if acceptable, recommends proceeding to the oral qualifying examination. An oral examination committee appointed by the dean of the Graduate Division examines the adequacy of the student's preparation to conduct the proposed research. Advancement to candidacy in the Ph.D. program follows successful completion of the oral examination.

The Oral Qualifying Exam can be taken in one of the following modes: In-Person or Hybrid. The student and their advisor will discuss which mode best suits the situation, with the advisor making the final determination. Students taking the exam In-Person are expected to present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the exam on campus in a video enabled room that supports some members physically present and others remote. The chair of the committee must be physically present for a Hybrid exam.

All Ph.D. candidates must satisfy the course requirements and have passed their written and oral qualifying exams within two years of entering the program, otherwise they will not be eligible to continue in the Ph.D. track. Exceptions can only be granted by the Graduate Advisor or by the Chair.

Dissertation and Final Oral Examination
A dissertation normally evolves from one of the research proposals. The dissertation must present original scholarly work and be approved by a dissertation committee before the student may take the final oral examination. Students must have satisfactory performance on the final oral examination given by the dissertation committee. Major emphasis in this examination is on the dissertation and related topics.

The Final Defense can be taken in one of the following modes: In-Person or Hybrid. The student and their advisor will discuss which mode best suits the situation, with the advisor making the final determination. Students presenting their Final Defense In-Person are expected to present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present their Final Defense on campus in a video enabled room that supports some members physically present and others remote.

Normative Time to Degree from the B.S.
17 quarters

Lower-Division Courses

GEO 001 The Earth's Crust and Interior 4 Lecture, 3 hours; laboratory, 3 hours; one 1-day field trip. Prerequisite(s): none. An introduction to the physical development of the Earth. Emphasis will be on Earth materials (rocks and minerals), processes (weathering, erosion, mountain building), structures (folds and faults), and current theories regarding the Earth's crust and interior.

GEO 002 Earth's Climate Through Time 4 Lecture, 3 hours; laboratory, 3 hours; one 2-day field trip. Prerequisite(s): none. An introduction to the history of Earth's changing climate and its relationship to the evolution of life on human to geologic time scales. Topics include the interrelationships among short- and long-term carbon cycling; plate tectonics; ocean and atmosphere circulation; and greenhouse gases through time.

GEO 003 Headlines in the History of Life 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. Explores the evolution of life beginning with precellular life. Topics include the origin of sex, multicellularity, vertebrate classes, morphological specializations, adaptive radiations, extinction dynamics, and the biology of dinosaurs. Cross-listed with BIOL 010.

GEO 004 Natural Hazards and Disasters 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENGL 001A or equivalent (may be taken concurrently). Application of basic principles of climate and geology to recognition of natural hazards and their mitigation. Topics include fires, freezes, floods, winds, landslides, volcanic eruptions, earthquakes and tsunamis. Emphasis is on confronting hazards of concern to home-buyers, planners, and conservationists in the western United States, especially southern California.

GEO 005 Geoscience in Movies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to Earth, Atmospheric, and Planetary Sciences using movies as support for visual learning. Topics include Earth structure and tectonic processes, climate change, impact craters and space exploration. Also addresses Earth science concepts and their portrayal in movies.

GEO 006 Planets in Science Fiction 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. Introduces the history of discoveries in planetary science and exoplanets and the influence on popular culture, movies, television, literature, and video games. Topics include planet discovery and exploration, planetary habitability, desert worlds, water worlds, moons, and terraforming in the context of science fiction.

GEO 007 Minerals and Human Health 4 Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): none. Overview of the role of minerals in human life and industrial activities. Topics include the impact of minerals on human health, the role of minerals in modern technologies, asbestos and silica problems, occupational diseases caused by inhalation of mineral dust, and environmental protection in California. May include a field trip.

GEO 008 Earthquake Country 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the study of earthquakes and the problems of living in earthquake country. Why earthquakes occur, how they are recorded, and what the effects are on man and his structures. The scientific and social consequences of earthquake prediction.

GEO 009 Oceanography 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to the geological, physical, chemical, and biological processes related to the characteristics and evolution of the ocean. Explores the ocean's role in regulating climate and the cycling of elements on Earth's surface. Illustrates how the oceans have been, and continue to be, a critical influence on life on Earth. Credit is awarded for one of the following GEO 009 or GEO 009H.

GEO 009H Honors Oceanography 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to GEO 009. A general introduction to the geological, physical, chemical, and biological processes related to the characteristics and evolution of the ocean system. Explores the role oceans play in regulating climate and the cycling of elements on the Earth's surface. Illustrates how the ocean system has been, and continues to be, one of the most important influences on life. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of GEO 009 or GEO 009H.

GEO 010 Earth Resources and Sustainability 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the occurrence, availability, marketing, and usage of metals, minerals, fossil fuels, nuclear fuels and other geologic resources, including both historic and recent trends. Addresses conflicts between modern society's need for increasingly scarce resources and mounting environmental problems. Also covers achieving sustainability through conservation, recycling, and substitution.

GEO 011 Global Climate Change 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Provides an understanding of Earth's feedback systems that regulate the climate over long- and short-term time scales. Includes oceanic and atmospheric circulation patterns, the major reservoirs and global carbon cycle, and the influence and origin of greenhouse gases. Investigates sustainability, climate change policies, adaptation, and mitigation. Credit is awarded for one of the following GEO 011 or GEO 011H.

GEO 011H Honors Global Climate Change 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to GEO 011. Provides an understanding of Earth's feedback systems that regulate the climate over long- and short-term time scales. Includes oceanic and atmospheric circulation patterns, the major reservoirs and global carbon cycle, and the influence and origin of greenhouse gases. Investigates sustainability, climate change policies, adaptation, and mitigation. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of GEO 011 or GEO 011H.

GEO 012 At Home in the Universe 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Considers the place of humans in space and time and the means by which this is discerned. Presents a synopsis of the history of the cosmos, Earth, life, and humanity from a science-based perspective. Discuss the implications of such knowledge for how responsible individuals choose to conduct themselves.

GEO 013 Our Planetary Neighbors: the Solar System and Beyond 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. A survey of the planets in the solar system focusing on comparative planetology. Explores the formation, structure, composition, and evolution of rocky and gas giant planets. Also addresses the night sky, the Earth's Moon, gravity, planetary motion, radiation, minor bodies, and exoplanets.

GEO 080 Astrobiology: the Search For Life in the Universe 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. Are we alone in the universe? This basic human question, once solely the domain of philosophy and science fiction, is now a field of considerable scientific research. Lecture and lab topics include the history of life on Earth, habitability in the solar system, and discovery of planets around other stars.

Upper-Division Courses

GEO 100 Igneous and Metamorphic Petrology 5 Lecture, 3 hours; laboratory, 6 hours; four field trips, Prerequisite(s): GEO 115 and GEO 122 with grades of "C-" or better. An introduction to the nomenclature and classification of igneous and metamorphic rocks. Includes identification of the major rock-forming minerals and common rocks in hand samples and thin sections, as well as interpretation of rock fabrics and textures. Explores tectonic setting and the origins of major rock types.

GEO 101A Field Geology 3 Lecture, 1 hour; laboratory, 3 hours; field, 35 hours per quarter. Prerequisite(s): GEO 115 with a grade of C- or better; or consent of instructor. Introduces geologic field mapping, aerial photograph interpretation, scaled vector graphic cartography, and professional report writing for igneous and metamorphic rock terranes.

GEO 101B Field Geology 3 Lecture, 1 hour; laboratory, 3 hours; field, 35 hours per quarter. Prerequisite(s): GEO 115 with a grade of C- or better; or consent of instructor. Introduces geologic field mapping, aerial photograph interpretation, scaled vector graphic cartography, and professional report writing for stratified sedimentary rock terranes.

GEO 102A Summer Field Geology 8 Field, 240 hours per quarter. Prerequisite(s): GEO 100 with a grade of C- or better; GEO 116 with a grade of C- or better; GEO 118 with a grade of C- or better, may be taken concurrently; GEO 101A with a grade of C- or better; GEO 101B with a grade of C- or better, may be taken concurrently; or consent of instructor. Intensive field training in the collection, interpretation, and communication of geologic data. Covers advanced geological mapping, sections, and production of professional geological reports. Requires multi-week fieldwork in summer. Course materials fee charged. GEO 102B the field component is required. Graded In Progress (IP) until GEO 102A and GEO 102B are completed, at which time a final grade is assigned.

GEO 102B Summer Field Geology 1 Field, 240 hours per quarter. Prerequisite(s): GEO 100 with a grade of C- or better; GEO 116 with a grade of C- or better; GEO 118 with a grade of C- or better; GEO 101A with a grade of C- or better or GEO 101B with a grade of C- or better; or consent of instructor. Intensive field training in the collection, interpretation, and communication of geologic data. Covers advanced geological mapping, sections, and production of professional geological reports. Requires multi-week fieldwork in summer. Course materials fee charged. Graded In Progress (IP) with GEO 102A. Offered in Summer only.

GEO 111 Numerical Skills in Geoscience 4 Lecture, 3 hours; laboratory, 3 hours; term paper, 1 hour. Prerequisite(s): MATH 007B or MATH 009B or MATH 009HB; or equivalent; or consent of instructor. Introduces the basic principles of how computer programs are written and numerical models are constructed, as well as teaches data processing and visualization skills. Fosters an ability to apply numerical techniques to problems in the Earth and Environmental Sciences.

GEO 115 Geologic Maps and Landforms 5 Lecture, 2 hours; laboratory, 6 hours; field, 30 hours per quarter. Prerequisite(s): GEO 001, may be taken concurrently; MATH 005A or MATH 006B or MATH 007A or MATH 009A or MATH 09HA. Examines characteristic patterns of bedrock outcrops, surficial deposits, the related landforms, and their representation on maps. Covers unconformities, folds, faults, intrusions, alluvial fans, river terraces, and landforms indicative of glaciers, volcanoes, landslides, and earthquakes. Applies map information to resource and hazard evaluation.

GEO 116 Structural Geology 5 Lecture 2, Laboratory 6, Field Trip 8 To 16, Prerequisite(s): GEO 115 with a grade of "C-" or better; PHYS 002A or PHYS 02HA or PHYS 040A or PHYS 040HA; or consent of instructor. Examines geological structures in the field. Covers the graphical solution of structural problems and laboratory map study, the genesis of rock structures, the physics of rock deformation, and Mohr diagrams and elementary stress analysis.

GEO 118 Sedimentology and Stratigraphy 5 Lecture, 2 hours; laboratory, 6 hours; two 1-day and one 2-day field trips, Prerequisite(s): GEO 115 with a grade of "C-" or better. A study of the principles of sedimentology and the comparative study of the origins of sediments and sedimentary rocks from various modern and ancient clastic, carbonate, and mixed siliciclastic-carbonate depositional environments. Emphasizes field and stratigraphic relationships, as well as petrographic and hand specimen identification.

GEO 122 Mineralogy 5 Lecture, 3 hours; laboratory, 5 hours; field trip, 8 to 16 hours per quarter. Prerequisite(s): both CHEM 001B and CHEM 01LB or both CHEM 01HB and CHEM 1HLB (CHEM 001B, CHEM 01LB, CHEM 01HB, and CHEM 1HLB may be taken concurrently); GEO 001 with a grade of "C-" or better. Provides an introduction to common and important minerals and their identification using structural, crystallographic, and optical microscopy methods. Stresses distinctive structural and chemical features, diagnostic physical and optical properties, anthropogenic uses, commonly associated minerals, and the growth and development of minerals in various geologic environments.

GEO 123 Analytical Mineralogy 5 Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC; GEO 122 with a grade of "C-" or better. Advanced techniques in mineralogy. Covers optical crystallography, with an introduction to X-ray diffraction, electron microscopy, and other analytical techniques.

GEO 124 Advanced Petrogenesis 4 Lecture, 2 hours; laboratory, 6 hours; two 1-day field trips. Prerequisite(s): GEO 100 with a grade of "C-" or better Explores advanced topics in the

petrogenesis of igneous and metamorphic rocks in the Earth's crust and mantle. Examines field and structural relationships of crystalline rocks and how thermodynamics, experimental phase equilibria, and computer modeling are used to study petrogenesis. Each student completes a field and laboratory research project and prepares a written and oral report on the project.

GEO 132 Groundwater Geology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CHEM 001B and CHEM 01LB or CHEM 01HB and CHEM 1HLB; MATH 007B or MATH 009B or MATH 09HB; PHYS 002A or PHYS 02HA or PHYS 040A or PHYS 040HA. Covers the character of waters in geologic media; including the chemical nature of groundwater and geothermal fluids; principles of fluid flow in sediments and rocks; chemical reactions between solutes and geologic media; contaminant migration in groundwater; behavior of geothermal fluids; modeling of groundwater and geothermal fluid flow in geologic media.

GEO 136 Introduction to Molecular and Petroleum Geochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC or equivalents; a grade of "C-" or better in one of the following courses: GEO 001, GEO 002, GEO 009 or GEO 011. Explores the global carbon cycle and the origin and fate of organic carbon molecules throughout Earth's history. Covers production and composition of biogenic matter and microbial, chemical, and thermal processing of sedimentary organic matter, leading to oil, gas, and coal formation. Addresses important applications to the petroleum and environmental sectors.

GEO 137 Geochemistry of Natural Waters 4 Lecture, 3 hours; laboratory, 30 hours per quarter. Prerequisite(s): both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC or equivalents; a grade of "C-" or better in one of the following courses: GEO 001, GEO 002, GEO 009 or GEO 011. Examines the chemical principles of geologic processes at and near Earth's surface. Topics include biogeochemical cycles of elements during chemical interactions of the Earth's crust, hydrosphere, and atmosphere; applications of thermodynamics and kinetics to the study of low-temperature geologic systems; and the use of isotopic techniques in tracing geologic processes.

GEO 138 Pedology 4 Lecture, 3 hours; laboratory, 6 hours per quarter; field, 24 hours per quarter. Prerequisite(s): ENSC 100; GEO 001; or consent of instructor. Covers the study of soils in natural environments. Examines how soils form and their roles within ecosystems and landscapes. Topics include soil variability, soil classification, and soils as indicators of environmental conditions. Field trips emphasize description and interpretation of soils. Requires two 3-hour Laboratory activities and four 6-hour Field Trips. Cross-listed with ENSC 138.

GEO 139 Soils and Landforms of California 1 Term paper, 6 hours; field, 24 hours. Prerequisite(s): ENSC 138, may be taken concurrently or GEO 138, may be taken concurrently; or consent of instructor. Explores the genesis, morphology, and classification of California soils with an emphasis on soil-landform relationships. One three-day field trip focuses on soils and landforms within selected regions of California. Cross-listed with ENSC 139.

GEO 140 Global Geophysics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): GEO 001 with a grade of C- or better; MATH 046; PHYS 002C or PHYS 02HC or PHYS 040C or PHYS 040HC; or consent of instructor. Introduces central concepts of solid earth geophysics as applied at the global or planetary scale. Includes plate tectonics and dynamics of the lithosphere; seismology and earth structure; geothermal behavior and heat flow; and geodynamics and planetary geophysics.

GEO 144 Earthquake Seismology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MATH 010A, MATH 010B, MATH 046, PHYS 002C or PHYS 02HC or PHYS 040C or PHYS 040HC; or consent of instructor. Introduction to the theories and observations of earthquake seismology. Student utilizes physical principles and mathematical techniques to study the earthquake process, wave propagation, and ground motion. Laboratory emphasizes computer-assisted analysis of various types of seismic data as well as simple modeling techniques.

GEO 145 Applied and Exploration Geophysics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): GEO 001 with a grade of "C-" or better; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC or PHYS 040C or PHYS 040HC; or consent of instructor. Introduces applied geophysical methods used to explore and characterize the shallow subsurface. Topics include gravity, magnetism, seismic reflection and refraction, electrical resistivity, electromagnetism, and ground penetrating radar. Explores techniques to solve problems related to groundwater, as well as environmental, mineral, and petroleum exploration and engineering issues. Requires a weekend field trip.

GEO 147 Active Tectonics and Remote Sensing 4 Lecture, 2 hours; discussion, 1 hour; laboratory, 3 hours., Prerequisite(s): GEO 001, GEO 115; or consent of instructor. A computer-based course that introduces active tectonics and the earthquake cycle and how they are studied using remote sensing data. Explores examples of actively deforming areas from around the world using computer visualization software and freely available data sources (satellite imagery, digital topography, GPS and earthquake data).

GEO 150 Your Future in the Earth and Planetary Sciences 1 Seminar, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. An exploration of potential careers and futures in the Earth and Planetary Sciences. Topics include career planning, exploring different job possibilities in the public and private sectors, applying for jobs and internships, undergraduate and graduate research, the graduate school application process, academic careers, and fellowships. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units.

GEO 151 Principles of Paleontology 4 Lecture, 3 hours; laboratory, 3 hours; one 1-day field trip. Prerequisite(s): BIOL 010/GEO 003 with a grade of "C-" or better or BIOL 005C. Emphasis is on understanding fossils as living organisms. Topics include fundamentals of evolution and the fossil record, introductory morphometrics and biosystemic theory, functional morphology, and metazoan organization and classification.

GEO 152 Principles of Invertebrate Paleobiology and Paleoecology 4 Lecture, 2 hours; laboratory, 3 hours; three 1-day field trips. Prerequisite(s): BIOL 005C with a grade of "C-" or better or BIOL 010/GEO 003 with a grade of "C-" or better. Topics include evolution and the fossil record, paleoecology, classification theory; the nature of adaptive radiations, and extinctions. Cross-listed with BIOL 152.

GEO 157 Introduction to Geographical Information Science 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing. Introduces the fundamental theory and application of geographical information science. Topics include geographic information systems, data structures, databases, and spatial data models. Explores various spatial data, including their coordinate systems, data acquisition, and associated errors. Introduces data analysis methods within geographical information systems.

GEO 158 Advanced Geographic Information System 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): GEO 157 or consent of instructor. Multidisciplinary applications of GIS analysis techniques including vector, grid, image, surface, and network systems. Covers photogrammetry and processing of remotely sensed imagery emphasizing data quality and error assessment. Introduction to graphical programming tool, ModelBuilder, and Python scripting language for automation and customization of tasks. No previous programming experience assumed.

GEO 160 Global Climate Change 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor; PHYS 002B or PHYS 02HB or PHYS 040B or PHYS 040HB recommended. Surveys historical and paleoclimate change using basic principles on gas laws, radiant energy exchange, atmospheric circulation and oceanography, and proxy data. Topics include variability in modern climate, greenhouse gases, global warming, El Nino, Pacific decadal oscillation, ozone hole, volcanism, ice age climate, and Milankovitch cycles. Also covers stable isotope profiles, plate tectonics, greenhouse climates, paleovegetation, modern species diversity, and snowball Earth.

GEO 161 Cenozoic Climate Change 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): one of the following courses with a grade of "C-" or better; GEO 001 or GEO 002 or GEO 009 or GEO 011. Examines physical, chemical, and biological evidence of

climatic and environmental change throughout the Cenozoic Era (last 65 million years) to provide a framework for understanding natural environmental change and for predicting future change. Introduces students to computer-based numerical methods of data analysis for interpreting past records of environmental change.

GEO 162 Geomorphology 4 Lecture, 2 hours; laboratory, 6 hours; one 2-day field trip. Prerequisite(s): ENSC 100 or GEO 115 (ENSC 100 or GEO 115 may be taken concurrently); or consent of instructor. A study of surficial processes related to the development and evolution of landforms and landscapes at the Earth's surface. Examines weathering, erosional, and depositional processes in a variety of landscapes (tectonic, volcanic, arid, karst, fluvial, glacial, coastal, anthropogenic, planetary, etc.). An emphasis is placed on processes and landscapes important to California.

GEO 163 Global Physical Climatology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 002B or PHYS 02HB or PHYS 040B or PHYS 040HB; restricted to class level standing of junior, or senior. Introduces elemental physical components of the Earth's climate system that include the atmosphere, the ocean, the land surface, and the cryosphere. Topics include global energy balance, atmospheric general circulation, ocean general circulation, atmosphere-ocean interaction, hydrological cycle, land surface processes, cryosphere, and natural climate variability.

GEO 167 Conservation Biogeography 4 Lecture, 3 hours; laboratory and field, 3 hours. Prerequisite(s): BIOL 005C with a grade of "C-" or better or BIOL 010/GEO 003 with a grade of "C-" or better. Application of biogeographic and ecological theories in the conservation of plants, animals, and wildlands. Topics include biological preserve design, ecological consequences of land development, and wildlife-habitat relationships.

GEO 169 California Vegetation 4 Lecture, 3 hours; laboratory, 3 hours; two 1-day field trips. Prerequisite(s): BIOL 005C with a grade of "C-" or better or BIOL 010/GEO 003 with a grade of "C-" or better. Survey of the flora, distribution, and ecology of California ecosystems, including Mediterranean shrubland, conifer forests, desert scrub, valley for fields, and exotic grasslands. Discusses vegetation in relation to climate, physiography, fire, landscape steady states, biological invasions, paleobotany, and broad-scale change due to land development, invasive species, grazing, and fire suppression.

GEO 180 Exoplanetary Science Detection Tech 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 007B or MATH 009B or MATH 09HB; PHYS 040B or PHYS 002B; PHYS 117 or GEO 111; Restricted to class level standing of junior, or senior; or consent of instructor. Covers the rapid expansion of the subject of exoplanets, the discoveries of which now number in the thousands and include planets smaller than Earth. Topics include solar system formation, the history of exoplanetary science, orbital mechanics, detection methods, orbital ephemerides, host stars, and future exoplanet space missions.

GEO 181 Exoplanetary Science Characterization 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 007B or MATH 009B or MATH 09HB; PHYS 040B or PHYS 002B; PHYS 117 or GEO 111; GEO 180; Restricted to class level standing of junior, or senior; or consent of instructor. Covers the detailed characterization of exoplanets including new discoveries that are being made from past and present exoplanet missions. Topics include orbital dynamics and architectures, tidal effects, planet formation, circumbinary planets, phase variations, planetary atmospheres, exomoons, and future exoplanet space missions.

GEO 182 Planetary Astrobiology For Science Majors 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001B or CHEM 01HB; MATH 007B or MATH 009B or MATH 09HB; PHYS 002B or PHYS 02HB or PHYS 040B or PHYS 040HB; or consent of instructor. An overview of the origin, evolution, distribution, and future of life in the universe. Explores the physics and chemistry of life; formation and evolution of planets; origin of life; habitable environments in the solar system (Mars, Venus, icy moons); exoplanet biosignatures; and the search for extraterrestrial intelligence.

GEO 184 Planetary Atmospheres 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 007B or MATH 009B or MATH 09HB; PHYS 002B or PHYS 02HB or PHYS 040B or PHYS 040HB; restricted to class level standing of junior, or senior; or consent of instructor. A quantitative overview of the atmospheric structure, composition, climate, evolution, and circulation of planets within and outside the solar system. Focus areas include hydrostatic equilibrium, convection and lapse rates, photochemistry, escape processes, radiative transfer and spectroscopy, atmospheric formation, and basic fluid mechanics applied to circulation. Credit is awarded for one of the following GEO 184 or GEO 284.

GEO 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): upper-division standing; consent of instructor and department chair. Individual study to meet special curricular needs. Course is repeatable to a maximum of 9 units.

GEO 191 Undergraduate Seminar in Geological Sciences 1 Seminar, 1 hour. Prerequisite(s): open to upper division Geological Sciences majors only. For undergraduate students who desire formal participation in the weekly departmental seminar. In addition to attending the seminar, students must write abstracts describing two of the presentations. May be repeated to a total of 6 units.

GEO 195A Senior Thesis 3 to 5 Hours per week to be established by supervisor, Prerequisite(s): senior status; consent of instructor. Preparation of a thesis based upon supervised field and/or laboratory research and literature review in the geological sciences. The thesis may be undertaken as a one-, two-, or three-quarter sequence. In the case of a two- or three-quarter sequence, the final grade will be deferred until completion of the last quarter. Total credits for GEO 195A, GEO 195B, and GEO 195C may not exceed 9 units.

GEO 195B Senior Thesis 3 to 5 Hours per week to be established by supervisor, Prerequisite(s): senior status; consent of instructor. Preparation of a thesis based upon supervised field and/or laboratory research and literature review in the geological sciences. The thesis may be undertaken as a one-, two-, or three-quarter sequence. In the case of a two- or three-quarter sequence, the final grade will be deferred until completion of the last quarter. Total credits for GEO 195A, GEO 195B, and GEO 195C may not exceed 9 units.

GEO 195C Senior Thesis 3 to 5 Prerequisite(s): senior status; consent of instructor. Preparation of a thesis based upon supervised field and/or laboratory research and literature review in the geological sciences. The thesis may be undertaken as a one-, two-, or three-quarter sequence. In the case of a two- or three-quarter sequence, the final grade will be deferred until completion of the last quarter. Total credits for GEO 195A, GEO 195B, and GEO 195C may not exceed 9 units.

GEO 198I Independent Internship 1 to 12 Field, 3 to 36 hours. Prerequisite(s): consent of instructor, undergraduate advisor, and department chairman. Independent study in a surrogate job condition under non-university supervision. Internships are normally in public or private institutions such as planning departments, research labs, or industry. Position, task, method of reporting completion and accomplishments, and units must have prior agreement among student, instructor, and supervisor. One unit for every three hours per week spent in internship. Graded Satisfactory (S) or No Credit (NC).

Graduate Courses

GEO 201A Research and Proposal Design 2 Seminar, 1 hour; written work, 3 hours. Prerequisite(s): graduate standing. Teaches the fundamentals of research topic selection and development of hypotheses. Addresses presentation techniques and design of research projects, experiments, and field campaigns. Includes preparation and discussion of small grant proposals, as well as short oral presentations related to applicable areas of study. Graded Satisfactory (S) or No Credit (NC).

GEO 201B Proposal Writing and Review 2 Seminar, 1 hour; written work, 3 hours. Prerequisite(s): graduate standing, GEO 201A; or consent of instructor. Covers the writing and review processes for major grant proposals. Includes the preparation, review, ranking, and summarizing of full-length federal grant proposals in accordance with federal panel guidelines. Graded Satisfactory (S) or No Credit (NC).

GEO 203 Mineral Equilibria 4 Lecture, 4 hours. Prerequisite(s): GEO 137; graduate standing; or consent of instructor. Applications of thermodynamics and kinetics to evaluating equilibria among minerals and fluids in

geological environments. Emphasis placed on equilibria in geothermal systems, ore deposits, metamorphic and igneous rock, and groundwater.

GEO 205 Geohydrology 4 Lecture, 3 hours; laboratory, 3 hours; one 1-day field trip. Prerequisite(s): GEO 132 or ENSC 163; graduate standing. Fluid flow in geologic media; resource evaluation; and relevant geologic hazards and geotechnical problems.

GEO 206A Stratigraphy 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): GEO 118; graduate standing; and consent of instructor. Covers rock stratigraphy and time stratigraphy with an emphasis on their principles, history, and methods. Includes reading and analysis of pertinent literature and field trips.

GEO 206B Stratigraphy 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): GEO 118; graduate standing; and consent of instructor. Covers time stratigraphy and biostratigraphy with an emphasis on their principles, history, and methods. Includes reading and analysis of pertinent literature and field trips.

GEO 212 Ecological Systems in Space and Time 4 Lecture, 3 hours; field, 30 hours per quarter. Prerequisite(s): one upper-division undergraduate course in population or community ecology or paleoecology; graduate standing; or consent of instructor. Focuses on how ecological systems are interpreted and reconciled at the community, landscape, and paleontological scales. Addresses the role of extrinsic factors operating at each of these scales. Also examines the historical development of our understanding of ecological systems at various scales. Cross-listed with EEOB 212, and ENTM 212.

GEO 219 Theory of Systematics 4 Lecture, 4 hours. Prerequisite(s): BIOL 112/BPSC 112/ENTM 112 or equivalent or consent of instructor. Examines topics developed around a series of classical and recent papers on the principles, philosophy, and methodology of modern systematics and phylogenetic methods. Cross-listed with EEOB 219, and ENTM 219.

GEO 221 Electron Microscopy and Microanalysis 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to electron microscopy and microanalysis of inorganic solids including minerals and synthetic materials. Students learn the physical principles, strengths, and limitations of the method. Laboratory provides hands-on experience with scanning and transmission electron microscopes and interpretation of images and data.

GEO 223 Seminar in Geobiology 1 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Lectures, discussions and demonstrations by students, faculty and invited scholars on current research topics in Geobiology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GEO 224 Sierran Studies: the Paleoclimate Record of the Sierra 4 Field, 90 hours per quarter; term paper, 3 hours. Prerequisite(s): graduate standing. A study of climate change in the Sierra Nevada Mountains, extending from Precambrian glacigenic sediments to modern glaciers. Utilizes field evidence to access the controls of climate and determine the resolution and limitations of the physical record. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topics change to a maximum of 8 units.

GEO 225A Geology of Carbonate Rocks 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): GEO 118; consent of instructor. Covers characterization, recognition, and interpretation of carbonate rocks. Laboratory work includes study of polished and thin sections of selected suites of rocks.

GEO 225B Geology of Detrital Rocks 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): GEO 118; consent of instructor. Covers characterization, recognition, and interpretation of detrital rocks. Laboratory work includes study of polished and thin sections of selected suites of rocks.

GEO 239 Current Topics in Hazards and Disasters 1 Seminar, 1 hour. Prerequisite(s): graduate standing; and consent of instructor. Explores current topics in hazards and disasters with an emphasis on cross-disciplinary and interdisciplinary research. Includes basic science, engineering, preparation, response, mitigation, and recovery. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GEO 240 Seminar in Earthquake Processes and Geophysics 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Explores selected contemporary topics in the areas of earthquake and fault processes, geophysics, active tectonics, and seismology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

GEO 241 Advanced Field Geophysics 14 Lecture, 10 hours; laboratory, 1 hours; field, 14 hours. Prerequisite(s): GEO 140; proficiency in a word processing, spread sheet, or programming language. Advanced applications of modern geophysical field techniques to the solution of complex geological problems, using seismic refraction and reflection, electrical and electromagnetic, potential field, and well-logging methods.

GEO 242 Numerical Methods and Modeling in the Geosciences 4 Lecture, 3 hours; laboratory, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers numerical computing methods and their application to problems of geological and geophysical interest. Methods include linear least-squares, matrix factorization, decomposition and inversion, nonlinear optimization, and Monte Carlo analysis and data visualization and their implementation in the MATLAB language. Applications include time series analysis, seismic tomography, and geodetic data inversion. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

GEO 243A Earthquake Physics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): GEO 144, MATH 010B, PHYS 40C, basic computer programming experience; or consent of instructor. MATH 046 is recommended. An exploration of the physics of the earthquake process. Focuses on processes controlling fault slip and friction mechanics, as well as modeling the space/time characteristics of earthquake occurrence. Utilizes theoretical/analytical tools and numerical models. Includes an independent project in computer modeling.

GEO 243B Earthquake Physics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): GEO 144, MATH 010B, PHYS 040C or PHYS 040HC, basic computer programming experience; or consent of instructor. MATH 046 is recommended. An exploration of the physics of the earthquake process. Focuses on fault dynamics during the earthquake rupture and slip processes and its relationship to ground motion. Utilizes theoretical/analytical tools and numerical models. Includes an independent project in computer modeling.

GEO 244 Space Geodesy 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers the study of the shape and deformation of the Earth's surface using satellite data (InSAR and GPS). Includes measuring topography and surface deformation; processing, visualization and interpretation of data; simple analytical and numerical deformation models; and applications of techniques to tectonic, volcanic, and non-tectonic problems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

GEO 247 Structure, Composition and Evolution of the Solid Earth 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Combines geophysical and geochemical principles to constrain formation, composition, structure, and dynamics of solid Earth from core to crust. Begins with building Earth from solar system materials. Investigates core formation and continental crust creation. Explores geophysical and geochemical consequences of plate tectonic processes. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

GEO 248 Modern Field & Visualization Methods 4 Lecture, 3 hours; laboratory, 2 hours; field, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Provides an introduction to state-of-the-art field and 3D visualization techniques with a multidisciplinary emphasis. Teaches digital field mapping methods exportable to geographic information system (GIS) and range imaging techniques to create 3D models. Includes opportunities to utilize student-collected UAV data and a 3D printer. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

GEO 249 Tectonic Geomorphology and Quaternary Field Techniques 4 Lecture, 2 hours; discussion, 1 hour; field, 30 hours per quarter. Prerequisite(s): GEO 101A or GEO 101B or GEO 162; graduate standing; or consent

of instructor. Examines topics in tectonic geomorphology. Includes paleoseismology, geodesy, geochronology, landscape response, numerical modeling, and terrain analysis. Covers field techniques such as relative and calibrated dating analysis, section measurements, morpho- and lithostratigraphic analysis, and reconstruction of Quaternary events from landforms. Addresses map constructions in fluvial, lacustrine, glacial, coastal, and eolian environments.

GEO 250 Graduate Seminar in Geological Sciences 1 Seminar, 1 hour. Prerequisite(s): graduate student status. Oral reports by graduate students, faculty, and visiting scholars on current research topics in geological sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GEO 251 (E-Z) Advanced Topics in Paleontology 3 to 5 Seminar, 3 hours; laboratory, hour. Prerequisite(s): graduate standing. Selected advanced topics in paleontology. Content varies from quarter to quarter. After consultation with the instructor, students enroll in only the seminar (3 units) or in both the seminar and laboratory (4-5 units). May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of units.

GEO 251I Advanced Topics in Invertebrate Paleontology 3 to 5 Seminar, 3 hours; laboratory, 0 to 6 hours. Prerequisite(s): graduate standing; and consent of instructor. Selected advanced topics in invertebrate paleontology. Content varies from quarter to quarter. After consultation with the instructor, students enroll in only the seminar (3 units) or in both the seminar and laboratory (4-5 units). May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable.

GEO 252 Marine Paleoecology 3 Lecture, 1 hour; discussion, 1 hour; two 1-day field trips. Prerequisite(s): graduate standing. Examines fundamental principles of paleoecology and the measurement of biodiversity, abundance, and biomass from the fossil record. Covers the significance of mass extinctions, diversification events, and environments on the Earth's changing marine ecosystem. Includes taphonomy, ichnology, and field studies. Course is repeatable to a maximum of 6 units.

GEO 253 Advanced Topics in Petrology and Geochemistry 3 to 5 Seminar, 3 hours; laboratory, 1 to 6 hours, Prerequisite(s): consent of instructor. Selected advanced topics from petrology and geochemistry of igneous, metamorphic, and sedimentary rocks. Course content varies from year to year. Course is repeatable to a maximum of 6 to 10 units.

GEO 254 Topics in Paleobiology 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Explores selected contemporary topics in the area of paleobiology including evolutionary radiations, mass extinctions, paleoecology, biotic response to climate change, and the evolution of animals on planet Earth. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

GEO 255 Advanced Topics in Sedimentary Petrology 4 Seminar, 2 hours; laboratory, 6 hours. Prerequisite(s): GEO 225A, GEO 225B. Selected advanced topics from sedimentary petrology and physical stratigraphy. Course content varies from year to year. Course is repeatable.

GEO 256 Data Analysis For Geoscientists 4 Discussion, 3 hours; lecture, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. A computer-based course that introduces Python with applications to Earth and Planetary Sciences. Topics include variables, data structures, loop, modules, object oriented programming, and the use of Python packages such as NumPy, Matplotlib, Pandas, ObsPy, and PyGMT to analyze and plot geophysical, geological, and climate data.

GEO 257 (E-Z) Advanced Topics in Geophysics 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Selected advanced topics from geophysics. Course content varies from quarter to quarter. Course is repeatable to a maximum of 12 units.

GEO 257E Geomagnetic Fields 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; and consent of instructor. Covers issues in the study of geomagnetic fields from a geophysical perspective, including fundamentals of magnetohydrodynamics and plasma physics, internal and external sources of geomagnetic fields, structure and variability of the field, dynamo theory, and deep geomagnetic soundings. course is repeatable to a maximum of 12 units.

GEO 257G Earthquake Prediction 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; and consent of instructor. Reviews past and current efforts to predict earthquakes and the physics underlying those efforts. Covers laboratory experiments on rocks near failure, focused monitoring studies, probabilistic hazards modeling, and earthquake precursors. Course is repeatable to a maximum of 12 units.

GEO 257H Finite Element Methods 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; and consent of instructor. Covers finite element methods to model geophysical phenomena. Topics include wave propagation, numerical fault dynamics, and hydrodynamics. Students complete a final project, which consists of writing a finite element code that solves a geophysical problem. Course is repeatable to a maximum of 12 units.

GEO 257I Inversion Theories 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Presents methods of parameter estimation applied to geophysical systems, with emphasis on underdetermined systems in earth sciences. Covers applications of network theory to inverse problems, Backus-Gilbert inversion, applications of geological information as constraints, regularization of inverse problems, least squares inversion, maximum likelihood inversion, tomography, and applications of inversion theory to potential fields, seismology, and electromagnetic problems. Course is repeatable to a maximum of 12 units.

GEO 257K Rock Mechanics 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; and consent of instructor. Covers the flow and fracture of rocks, including stress and deformation, brittle failure, frictional sliding, and high- and low-temperature flow in the laboratory or field. Course is repeatable to a maximum of 12 units.

GEO 259 Tectonics of California 4 Lecture, 2 hours; seminar 2, hours. Prerequisite(s): graduate standing; and consent of instructor. Geological, geophysical, and paleontological bases of interpreting tectonic development of California, with special emphasis on southern California. Interdisciplinary approach will be emphasized. Weekly reading assignments, active participation in discussions, and appropriate field and library research will be required. Participants will prepare two papers and give presentations.

GEO 260 Global Climate Change 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): PHYS 002C or PHYS 02HC or PHYS 040C or PHYS 040HC ; or consent of instructor. Explores global climate change in historic and geologic time scales. Topics include ocean-atmosphere feedbacks, El Nino, Pacific decadal oscillation, anthropogenic CO2, volcanism, cosmic rays, polar ozone depletion, global climate modeling, stable isotopes, "ice house" Pleistocene climates, "greenhouse" climates of the Mesozoic and Tertiary, plate tectonics, and the "snowball" Earth.

GEO 261 Atmosphere, Ocean and Climate Dynamics Seminar 1 Discussion, 1 hour; extra reading, 1 hours. Prerequisite(s): graduate standing or consent of instructor. Explores selected contemporary topics in the areas of atmospheric science, oceanography, climate dynamics, aerosol physics, and climate change through the twentieth and twenty-first centuries. Graded Satisfactory (S) or No Credit (NC).

GEO 262 Precambrian Geology 5 Lecture, 3 hours; seminar, 1 hour; field, 30 hours per quarter. Prerequisite(s): GEO 118 with a grade of C- or better; or equivalent; graduate standing; or consent of instructor. Explores the history of Earth from its origin to the late Neoproterozoic when animals evolved. Emphasizes sedimentary and geochemical records. Also discusses magmatic and tectonic evolution to provide an Earth Systems perspective. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

GEO 263 Organic and Petroleum Geochemistry 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing; BIOL 010/GEO 003; CHEM 001C or equivalent; or consent of instructor. Explores the geologic fate of organic molecules in the sedimentary record, from fossil DNA to lipids. Addresses current analytical techniques used for detecting molecular fossils and for characterizing sedimentary organic matter. Covers topical applications of organic geochemical tools to archaeology, geobiology,

paleoclimatic and paleoenvironmental reconstruction, petroleum exploration, and cosmochemistry research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

GEO 264 Biogeochemical Cycles Through Time 3 Lecture, 3 hours; two to three 2-day field trips. Prerequisite(s): BIOL 010/GEO 003; CHEM 001C or equivalent; GEO 001; GEO 002; or consent of instructor. A comprehensive exploration of the major biogeochemical cycles at and near Earth's surface. Emphasis is on microbially mediated cycling of elements and isotopes within diverse sedimentary environments and the cause-and-effect relationships with the ocean and atmosphere. Explores 4 billion years of biospheric evolution in light of these cycles. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

GEO 265 Special Topics in Earth and Environmental Sciences 1 to 3 Seminar, 1 to 3 hours. Prerequisite(s): graduate standing. Involves oral presentations and small-group discussions of selected topics in the areas of biogeochemistry, global climate change, geomicrobiology, earth surface processes, and interplanetary life. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes to a maximum of 10 units. Cross-listed with ENSC 265.

GEO 266 A Practical Introduction to Earth System Modeling and Dynamics 4 Lecture, 1 hour; discussion, 2 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduction to, and practical hands-on learning in, Earth system modelling and dynamics. Development of a variety of new computer skills and experience with data analysis and visualization techniques, and an understanding of climate, global carbon cycling, and marine ecology, plus past and future global change.

GEO 267 Physical Oceanography 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. An introduction to basic ideas and main concepts of physical oceanography. Topics include physical properties of seawater such as thermal expansion; modern ocean observations such as XBT, CTD, drifting floats and satellite observations; ocean mixing; sea surface height; ocean currents and the Thermohaline Circulation.

GEO 268 Seminar in Biogeography 4 Seminar, 2 hours; research, 6 hours. Prerequisite(s): graduate standing. Topics include Mediterranean ecosystems, fire ecology, naturalization of exotic species, succession and ecosystem steady state theory, and mapping of vegetation.

GEO 269 Geophysical Fluid Dynamics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. An introduction to fundamental concepts of geophysical fluid dynamics. Topics include basic equations, conservation laws, circulation, vorticity, Kelvin's Theorem, and potential vorticity conservation. Also includes shallow water Rossby wave dynamics such as quasi-geostrophic equation, Rossby waves, group velocity and energy propagation, Ekman dynamics, Sverdrup flow, and basics of stratified fluid.

GEO 270 Fundamentals of Digital Signal Processing in Geosciences 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduction to the central concepts of digital signal processing that are routinely used in a range of disciplines in geosciences. Emphasizes understanding and implementations of theoretical concepts, methods, and algorithms. Includes Fourier series of periodic and non-periodic signals; linear systems; convolution; windowing; sampling; zeropadding; auto and cross-correlation; and digital filtering.

GEO 271 Global Seismology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces the fundamentals of global earthquake seismology. Covers basic theory and concepts in seismology, seismic waves, and their applications to understand earthquake source and earth structure. Includes concepts and applications of observational seismology, earthquake imaging, foreshocks, aftershocks, and earthquake triggering.

GEO 272 Array Seismology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces fundamentals of array techniques. Covers concepts and design of seismic array, techniques of array data processing, and applications. Includes hands-on training with state-of-the-art seismometers. Emphasizes the array methods and their applications to image earthquake source leading to the understanding of earthquake dynamics and underlying physics.

GEO 275 Geophysical Inverse Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Covers methods for solving inverse problems with numerous applications in geosciences. Investigates problems that use observational data to infer properties of an unknown physical model. Topics include method of least squares, estimation of uncertainties, linearization of nonlinear problems, the eigenvalue problem, the singular-value decomposition, and non-linear problems in geophysics.

GEO 280 Planetary Habitability 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Covers terrestrial planet discoveries and studies of what makes a planet habitable. Topics include habitability factors, planetary atmospheres and interiors, the role of magnetic fields, Milankovitch and geological cycles, biosignatures, and a detailed look at what can be learned from solar system bodies.

GEO 283 Graduate Seminar in Astrobiology 1 Seminar, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Offers lectures, discussions, and reports by students, faculty, and invited scholars on current research topics in Astrobiology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GEO 284 Planetary Atmospheres 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. A quantitative overview of the atmospheric structure, composition, climate, evolution, and circulation of planets within and outside the solar system. Focus areas include hydrostatic equilibrium, convection and lapse rates, photochemistry, escape processes, radiative transfer and spectroscopy, atmospheric formation, and basic fluid mechanics applied to circulation. Credit is awarded for one of the following GEO 284 or GEO 184.

GEO 290 Directed Studies 1 to 6 Research 3 to 18 hours. Prerequisite(s): graduate standing; and consent of instructor. Research and special studies in the geological sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GEO 291 Directed Studies in Hazards and Disasters 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; and consent of instructor. Research and special studies in hazards and disasters. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GEO 297 Directed Research 1 to 6 Research, 3 to 18. Prerequisite(s): graduate standing; and consent of instructor. Research for individual graduate students in geological sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GEO 299M Research For Master's Thesis 1 to 12 Research, 3 hours per unit. Prerequisite(s): graduate standing; and consent of instructor. Thesis research. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GEO 299P Research For Dissertation 1 to 12 Research, 3 hours per unit, Prerequisite(s): graduate standing; consent of instructor. Research for dissertation, arranged in consultation with the staff. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

GEO 301 Teaching of Geosciences at the College Level 1 Seminar, 1 hour. Prerequisite(s): graduate standing in Geological Sciences. A program of weekly meetings and individual formative evaluation required of new Teaching Assistants for Geosciences courses. Covers instructional methods and classroom/section activities most suitable for teaching Geosciences. Conducted by the Teaching Assistant Development Program. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GEO 302 Teaching Practicum 1 to 4 Seminar, 1 to 4 hours; practicum, 2 to 8 hours. Prerequisite(s): restricted to those graduate students appointed as Teaching Assistants Supervised teaching of upper and lower-division courses in Geosciences. Required of all Teaching Assistants. Graded Satisfactory (S) or No Credit (NC). Course is repeatable for credit, but units not applicable toward degree unit requirements.

Economics

Subject abbreviation: ECON
College of Humanities, Arts, and Social Sciences

Marcelle Chauvet, Ph.D., Chair
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Professors

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Professors Emeriti

Richard Arnott, Ph.D., *Distinguished Professor* (in memoriam)
Taradas Bandyopadhyay, Ph.D.
Susan B. Carter, Ph.D.
Ronald H. Chilcote, Ph.D.
Gary A. Dymski, Ph.D.
David H. Fairris, Ph.D.
Keith B. Griffin, Ph.D., *Distinguished Professor*
Azizur R. Khan, Ph.D.
Victor D. Lippit, Ph.D. (in memoriam)
David Malueg, Ph.D.
Prasanta K. Pattanaik, Ph.D.
Roger L. Ransom, Ph.D. *Distinguished Professor of History* (Cooperating Faculty)
R. Robert Russell, Ph.D., *Distinguished Professor* (in memoriam)
Howard J. Sherman, Ph.D., Jur.D.
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Veronica T. Sovero, Ph.D.
Bohan Ye, Ph.D.

Cooperating Faculty

Kenneth A. Baerenklau, Ph.D. (Environmental Sciences)
Kurt A. Schwabe, Ph.D. (Environemental Sciences)

Majors

Economics studies the production and distribution of goods and services, as well as the way in which productive activity helps shape social existence. Economists are concerned with the factors determining national income, inflation, unemployment, output, growth and inequality (macroeconomics), as well as the behavior of individual decision-making units such as households and firms (microeconomics). Economists are also concerned with the role of markets, money and interest rates, the forces affecting international trade, and many other problems of production and distribution.

Economics is the basis for many careers, some of which require only a B.A. degree while others require more advanced work. Possible careers include, but are not limited to, business, government, education and law.

Students in the Economics Department can choose from four degree programs. The B.A. is the most general degree offered. It is appropriate background for a wide variety of purposes, including graduate study and professional schools. However, those planning to attend a graduate program in economics may need more quantitative training than the B.A. requires. Students who are considering attending a graduate program in economics should consult with their undergraduate advisor. The department offers the B.A. degree in a joint program with Administrative Studies for students that would like to partner their economics training with courses in general business fields. The department also offers the B.A. degree in a joint program with Law & Society for students who would like to prepare to attend law school or work in the public sector. The Business Economics B.A. degree guides students to take economic courses that will provide more specific preparation for careers in business administration or management or for graduate work in business.

Transfer Admissions

Students transferring as juniors or seniors to UCR into any of the Economics majors must have completed a calculus course equivalent to UCR's Math 9A.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

MATH 009A and MATH 009B may also be used to meet breadth requirements.

Major Requirements

The Economics Department offers B.A. degrees in Economics, Business Economics, Economics/Administrative Studies, and Economics/Law and Society.

First Time Freshmen admits and students approved for a major change with freshman standing must be eligible to enroll into MATH 006A by the fall quarter of their second year. Transfer student admits with sophomore standing or lower must be eligible to enroll into MATH 006A or higher by the start of their third quarter enrollment. All students must complete their lower-division requirements by enrolling in applicable courses until the requirements are met. Students who do not complete their lower-division requirements in a timely fashion and with at least the minimum required grade average will not be permitted to continue in the Economics, Business Economics, Economics/Administrative Studies, or Economics/Law and Society major. Students must check course descriptions for prerequisite requirements.

Change of Major Criteria for ECON and BSEC:

Students must be in good academic standing at the time the Change of Major Petition is filed. AP/IB units are excluded from the maximum unit calculation. All courses listed below must be completed with grades of C- or better.

0 – 45 earned units:
MATH 006A or higher

45 – 89 earned units:
ECON 002 or ECON 003 and MATH 006B or MATH 005A or higher

90+ earned units:
ECON 002, ECON 003, and MATH 009A or equivalent

Change of Major Criteria for ECAT:

Students must be in good academic standing at the time the Change of Major Petition is filed. AP/IB units are excluded from the maximum unit calculation.

0 – 45 earned units:
MATH 006A or higher with a grade of C- or better

45 – 89 earned units:
ECON 002 or ECON 003 and MATH 006B or MATH 005 or higher with grades of C- or better

90+ earned units:
ECON 002 and ECON 003 with grades of C- or better, and MATH 009A or equivalent

Change of Major Criteria for ECLW:

Students must be in good academic standing at the time the Change of Major Petition is filed.

ECON 002 and ECON 003 with grades of C- or better, MATH 009A or equivalent, and LWSO 100 with a grade of "C" or better

Economics Major

The major requirements for the B.A. degree in Economics are as follows:

1. Lower-division requirements (4 courses [at least 18 units])
   a) ECON 002 or ECON 002H, ECON 003 or ECON 003H with grades of C- or better
   b) MATH 009A or MATH 09HA, MATH 009B or MATH 09HB
2. Upper-division requirements (12 courses [at least 54 units])
   a) ECON 104A, ECON 104B
   b) ECON 105A, ECON 105B
   c) ECON 101, ECON 107
   d) One four or five unit course with ECON 104B or ECON 105B or ECON 107 as a prerequisite.

e) Five additional upper-division courses in Economics worth 4 or 5 units each, including at least three that have either ECON 104A or ECON 105A or ECON 107 as a prerequisite. ECON 102, 103, and 190 cannot be used to meet this requirement.

Note: Up to 4 units of internship credit may be counted toward the upper-division electives in Economics.

Business Economics Major

The major requirements for a B.A. degree in Business Economics are as follows:

1. Lower-division requirements (five courses [at least 22 units])
   a) ECON 002 or ECON 002H, ECON 003 or ECON 003H with grades of C- or better
   b) BUS 020
   c) MATH 009A or MATH 09HA, MATH 009B or MATH 09HB
2. Upper-division requirements (12 courses [at least 54 units])
   a) ECON 104A, ECON 104B
   b) ECON 105A, ECON 105B
   c) ECON 101, ECON 107
   d) Five additional upper-division courses in Economics worth 4 or 5 units each, including at least two courses from ECON 108, ECON 130, ECON 135, BUS 153/ ECON 153, BUS 160/ECON 160, BUS 162/ECON 162, ECON 163. ECON 102, 103, and 190 cannot be used to meet this requirement.
   e) One course chosen from POSC 182, PSYC 142, SOC 151

Note: Up to 4 units of internship credit may be counted toward the upper-division electives in Business Economics.

Economics/Administrative Studies Major

In order to receive a B.A. degree in Economics/Administrative Studies students must fulfill the following requirements:

Economics requirements (12 courses, 55 units)

1. ECON 002 or ECON 002H, ECON 003 or ECON 003H with grades of C- or better
2. ECON 104A, ECON 104B, ECON 105A
3. Four additional upper-division courses in Economics worth 4 or 5 units each, including at least two that have either ECON 104A or ECON 105A or ECON 107 as a prerequisite. ECON 102, 103, and 190 cannot be used to meet this requirement.
4. ECON 101, ECON 107
5. One of MATH 009A, MATH 009HA, or equivalent

Note: Up to 4 units of internship credit may be counted toward the upper-division electives in Economics.

Administrative Studies requirements (37 units)

1. **Lower-division courses** (17 units)
   a) BUS 010, BUS 020
   b) STAT 008 or equivalent (may be used to satisfy breadth requirements)
   c) CS 008 (may be used to satisfy breadth requirements)
2. **Upper-division requirements** (20 units)
   a) Two courses (8 units) from the list below:
   (1) ECON 102 or ECON 103 or ECON 104A or ECON130 or ECON 162/BUS 162
   (2) PSYC 140 or PSYC 142
   (3) SOC 150 or SOC 151
   (4) POSC 181 or POSC 182 or POSC 183 or POSC 186
   (5) ANTH 127 or ANTH 127S or ANTH 131

   These two courses must be outside the discipline of Economics and cannot be courses included as part of the three-course Business Administration track or their cross-listed equivalents.
   b) A three-course track (12 units) in Business Administration courses from one of the following:
   (1) **Organizations (General):** BUS 100W, BUS 107, BUS 158/ANTH 105, BUS 176/SOC 176, SOC 150, SOC 151
   (2) **Human Resources Management/ Labor Relations:** BUS 100W, BUS 107, BUS 121, BUS 144, BUS 145, BUS 153/ ECON 153, BUS 155, BUS 156, BUS 157, PSYC 142
   (3) **Business and Society:** BUS 100W, BUS 102, BUS 107, PHIL 116, POSC 182E or POSC 182G, POSC 186
   (4) **Marketing:** BUS 103, and two from BUS 111, BUS 112, BUS 113, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119, BUS 124A, BUS 124B, BUS 126, BUS 151, BUS 152, BUS 159, BUS 164
   (5) **Managerial Accounting/Taxation:** BUS 108, and two from BUS 166, BUS 168A, BUS 168B
   (6) **Financial Accounting:** BUS 108, BUS 165A, BUS 165B, BUS 165C, BUS 167
   (7) **Finance:** BUS 106/ECON 134 and two from BUS 131, BUS 132, BUS 134, BUS 135, BUS 136, BUS 137, BUS 138, BUS 139 BUS 140E, BUS 141, BUS 147
   (8) **Management Information Systems:** BUS 101, BUS 110, BUS 125, BUS 128, BUS 171, BUS 172, BUS 173, BUS 174, BUS 175, BUS 179
   (9) **Production Management:** BUS 104/ STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

Note: In filling the dual requirements of the major students may not count more than two courses toward both parts of their total requirements. (This limitation applies to specified Economics requirements and specified Administrative Studies requirements, but does not apply to the required Mathematics and Statistics courses.)

Economics/Law and Society Major

The Law and Society major is open to undergraduate students with junior standing who have completed LWSO 100 with a grade of "C" or higher. The major requirements for the B.A. degree in Economics/Law and Society are as follows:

1. Economics requirements (11 courses [at least 49 units])
   a) ECON 002 or ECON 002H, ECON 003 or ECON 003H with grades of C- or better
   b) ECON 119
   c) ECON 104A, ECON 104B, ECON 105A
   d) Five additional upper-division courses in Economics worth 4 or 5 units each, including at least two that have either ECON 104A or ECON 105A or ECON 107 as a prerequisite. ECON 107 may be chosen as an advanced elective. ECON 102, 103, and 190 cannot be used to meet this requirement.

Note: Up to 4 units of internship credit may be counted toward the upper-division elective courses in Economics.

2. Law and Society requirements (36 units)
   a) PHIL 007 or PHIL 007H
   b) LWSO 100 (with a grade of "C" or better)
   c) One course chosen from POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
   d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
   e) Two courses chosen from HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180
   f) LWSO 193, Senior Seminar

Note: For sections 2.d) and 2.e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements. (This limitation applies to specified Economics requirements and Law and Society requirements.)

Minor

The minor in Economics provides a background in this discipline. Students take basic microeconomic and macroeconomic theory courses, and then are given freedom of choice in pursuing upper-division courses of great interest.

All candidates for the minor in Economics must take

1. Lower-division requirements (14 units):
   a) ECON 002 or ECON 002H and ECON 003 or ECON 003H with grades of C- or better
   b) One of MATH 009A, MATH 009HA, or equivalent
2. Upper-division requirements (at least 26 units):

a) ECON 102 or ECON 104A, ECON 103 or ECON 105A

b) Four additional upper-division courses (at least 16 units) in Economics

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Graduate Program

The Department of Economics offers the M.A. and Ph.D. degrees in Economics.

The graduate Economics program is designed to prepare students for research and teaching in academic institutions as well as for positions in government, international agencies, and the private sector.

Admission

Students are normally admitted only in the fall quarter. Applicants should apply electronically, at graduate.ucr.edu. Students submit the completed application, GRE scores, three letters of recommendation (from persons familiar with the student's academic work), and transcripts in duplicate of previous academic work.

Master's Program

There are two tracks to the M.A. degree. Track I (applied economics) has a capstone project requirement. Track II (economic theory) has a cumulative examination requirement. Students interested in Track I (applied economics) should apply for admission to the M.A. degree program. Students should have at least two courses in calculus, a course in statistics, and some upper- division economics courses, but exceptions will be considered for students whose applications have offsetting strengths. Admission to the Master of Arts degree program does not guarantee later admission to the Ph.D. program. Those interested in Track II (economic theory) should apply for admission to Ph.D. program.

Doctoral Program

The department encourages applicants from a variety of backgrounds, but a good understanding of intermediate microeconomics, intermediate macroeconomics, multivariate calculus, and elementary linear algebra is necessary to begin taking the core requirements, described below. In addition, two courses in basic probability and statistics or econometrics are required before beginning the core econometrics sequence. Students who do not satisfy the requirements, or who have been out of school for several years, should consider enrolling in the one-year M.A. program.

Master of Arts Degree

Master of Arts, Track I: Applied Economics

The M.A. with a concentration in applied economics is a one-year program designed primarily for students who intend to work as economists immediately after receiving the degree. It requires 42 quarter units of graduate (200-level) or upper- division undergraduate coursework, which includes a capstone project, as detailed below, with an overall GPA of 3.0.

Core Requirements

Students must complete at least five of the following six 4-unit courses: ECON 214A, 214B (Applied Microeconomics), ECON 215A, 215B (Applied Macroeconomics), ECON 216A, 216B (Applied Econometrics).

Professional Development Requirements

(2 units) Students must complete ECON 217 (Professional Development).

Capstone Project (4 units)

Students must complete a capstone project, taken as two courses ECON 218A, 218B (Capstone 1 and 2).

Field Requirements

Students must complete at least three 4-unit field courses from any of the fields, with at least two from ECON, from among the following:

1. **Business and Finance:**
   a) ECON 219 (Financial Economics)
   and one from
   b) MGT 202 (Financial Management) ***or***
   c) MGT 227 (Fixed-Income Securities and Markets)
2. **Applied Econometrics and Data Analysis:**
   a) ECON 220 (Big Data in Economics)
   b) ECON 221 (Forecasting for Economics Finance, and Business)
   c) STAT 208 (Statistical Data Mining Methods)
   d) PBPL 273 (Geographic Information Systems (GIS) For Public Policy)
3. **Economics and Public Policy:**
   a) ECON 222 (Public Economics)
   b) ECON 225 (Urban Economics)
   c) ECON 226 (Applied Environmental Economics)
   d) ECON 227 (Cost-Benefit Analysis)
   e) ECON 228 (Behavioral and Experimental Economics)
   f) PBPL 224 (Global-Local Policy Connections: Case Studies in Poverty, Water, and Sustainable Development)
   g) PBPL 233 (Environmental Economics)
   h) PBPL 236 (E-Z) (Urban and Spatial Analyses)
4. **Mathematical Economics:**
   a) ECON 229 (Mathematical Economics)
   and one from
   b) MATH 120 (Optimization) ***or***
   c) MATH 121 (Game Theory) ***or***
   d) MATH 144 (Introduction to Set Theory)
5. **Development Economics:**
   a) ECON 230 (Economic Development Theory, Applications, and Policy)
   b) ECON 231 (Randomized Evaluation in Development Policy)

Students who complete two courses within one of the five fields may choose to add the corresponding concentration to their degree in addition to the concentration in Applied Economics. Students who wish to devote more time to the capstone project may substitute ECON 297 (Directed Research) for one of the field courses.

Master of Arts, Track II: Economic Theory

The M.A. with a concentration in economic theory is awarded to students who have made sufficient progress towards meeting the core coursework and cumulative examination requirements of the Ph.D. program. It is awarded only to students admitted to the Ph.D. program. It requires 42 quarter units of coursework, 28 of which must be at the graduate (200 level), as detailed below, with an overall GPA of 3.0 and at least a master's level pass on a Ph.D. cumulative examination in either microeconomic theory or macroeconomic theory.

Core Requirements

Students must complete the following six courses:

1. ECON 200A, 200B (microeconomic theory)
2. ECON 201A, 201B (macroeconomic theory)
3. ECON 205A, 205B (econometric methods).

Students who plan to take the Ph.D. cumulative examination in microeconomic theory must first take ECON 200C (microeconomic theory). Those who plan to take the Ph.D. cumulative examination in macroeconomic theory must first take ECON 201C (macroeconomic theory)

Professional Development Requirements

(6 units) Students must enroll in at least one offering of ECON 289A (Colloquium in Economics) each quarter of their first year.

Cumulative Examination Requirement

A master's level pass on either a microeconomics or a macroeconomics cumulative examination.

Field Requirement

Students who complete two courses within a field may choose to add the corresponding concentration to their degree in addition to the concentration in Economic Theory.

1. **Econometrics:**
   a) ECON 285E (Advanced Econometric Methods)
   b) ECON 285F (Topics in Econometrics)
   c) ECON 285G (Applied Econometrics)
   d) ECON 285I (Macroeconometrics)
   e) ECON 285J (Nonparametric Econometrics)
   f) ECON 285K (Microeconometrics)
2. **Macroeconomic Theory:**
   a) ECON 282E (Foundations of Macroeconomics)
   b) ECON 282F (Advanced Monetary Theory)
   c) ECON 282G (Special Topics in Macroeconomic Theory)
3. **Microeconomic Theory:**
   a) ECON 283E (Rational Choice Theory)
   b) ECON 283F (Measurement and Aggregation in Economics)
   c) ECON 283G (General Equilibrium)
   d) ECON 283I (Social Choice and Welfare)
   e) ECON 283J (Uncertainty and Information)
   f) ECON 283K (Special Topics

in Microeconomic Theory)

g) ECON 283N (Application of Games and Information Economics)

4. **Development Economics:**
   a) ECON 260 (Theories of Economic Development)
   b) ECON 261 (Contemporary Development Strategies)
   c) ECON 262 (Investment, Productivity, and Organizations in Developing Countries)
   d) ECON 263 (Health, Labor and Human Capital in Developing Countries)
   e) ECON 264 (Topics in Economic Development)
   f) ECON 265 (Agricultural and Rural Development)
5. **International Trade Theory/ International Finance:**
   a) ECON 234 (International Trade Theory)
   b) ECON 235 (Topics in International Trade Theory)
   c) ECON 236/POSC 215 (Political Economy of International Finance)
   d) ECON 237 (Topics in International Finance)
6. **Labor Economics:**
   a) ECON 240 (Labor Demand)
   b) ECON 241 (Labor Supply)
   c) ECON 242 (Labor Market Equilibrium)
   d) ECON 243 (Topics in Labor)
   e) ECON 244 (Empirical Research Methods)
7. **Money, Credit and Business Cycles:**
   a) ECON 250 (Money, Credit, and the Macroeconomy)
   b) ECON 251 (Business Cycle Theory)
   c) ECON 254 (Topics in Money, Credit, and Business Cycles)
8. **Resource and Environmental Economics:**
   Students must complete three of the following:
   a) ECON 207 (Environmental Economics)
   b) ECON 208 (Natural Resource Economics)
   c) ECON 209 (Nonmarket Valuation and Environmental Policy)
   d) ECON 210 (E-Z) (Topics in Environmental Economics)
9. **Public Economics:**
   a) ECON 246 (Introduction to Public Economics)
   b) ECON 247 (Topics in Public Economics)
   c) ECON 248 (Topics in Political, Comparative, and Institutional Economics)

Doctoral Degree

The Ph.D. is designed for students who aim to pursue research careers in academic institutions, government, international agencies, and the private sector. Students first complete a core curriculum in economic theory and quantitative methods. These courses provide training in the fundamental concepts and research methods of the discipline. Following demonstration of professional competence in the core areas, students specialize in theoretical or applied areas of economics. This leads to the development of independent research and the writing of the Ph.D. dissertation.

Core Requirements

1. **Economic Theory**

Students must complete the following:

a) ECON 200A, ECON 200B, ECON 200C (Microeconomic Theory)

b) ECON 201A, ECON 201B, ECON 201C (Macroeconomic Theory)

All students must pass two cumulative examinations: one in microeconomic theory (covering topics encompassed in the course sequence ECON 200A, ECON 200B, and ECON 200C) and one in macroeconomic theory (covering the topics in ECON 201A, ECON 201B, ECON 201C). Both examinations are given at the end of the first year, and at the beginning of the fall quarter. After completing the sequence of courses, students must sit for each examination at each offering until they have passed the requirement. An unexcused failure to sit for a required examination will be regarded as a failure. All students can have two attempts. Only students who pass at least one of the exams in the first or second attempts can have a third attempt in the other failed exam. No student will be given more than three attempts to achieve a satisfactory grade on each one of the two examinations.

2. **Quantitative Methods**

Students must complete the following: ECON 205A, ECON 205B, ECON 205C (Econometric Methods I, II, III). To satisfy these course requirements, students must attain a "B" average in the sequences.

Core courses may be waived, based on equivalent graduate work completed elsewhere. The cumulative examinations, however, may not be waived.

Colloquium and Paper Requirement

Students must enroll in at least one offering of ECON 289A (Colloquium in Economics) each quarter of their first year and at least one offering of ECON 289B each quarter of their formal residence from the second year on. In addition, students must write a well-rounded research paper before the beginning of their fourth year. The research paper will be evaluated by members of the oral qualifying examination committee or members of the dissertation committee, if already formed. Students must give a presentation on their thesis research by the end of Spring of their fourth year. Students must also present their job market paper in the Fall or Winter of their fifth year.

Field Requirements

By the end of the second year of the program, All students must:

i. complete course work in a major field consisting of three courses.

and

ii. take six additional field courses in any of the fields.

Students must pass a comprehensive examination in their field. Comprehensive examinations in each major field are given twice a year. After completing the major field courses, students must take the next scheduled examination. The exams are given by the end of Summer and if necessary, at the end of Fall quarter. All students can have a maximum of two attempts in a given field, and can take field exams in no more than two fields, after completing their respective field courses.

1. **Advanced Econometrics**

Students must complete the courses a) and b) and one of the courses from c), d), e), or f) listed below.

a) ECON 285E (Advanced Econometric Methods)
b) ECON 285F (Topics in Econometrics)
c) ECON 285G (Applied Econometrics)
d) ECON 285I (Macroeconometrics)
e) ECON 285J (Nonparametric Econometrics)
f) ECON 285K (Microeconometrics)

2. **Advanced Macroeconomic Theory**

Students must complete the following:

ECON 282E (Foundations of Macroeconomics)

ECON 282F (Advanced Monetary Theory)

ECON 282G (Special Topics in Macroeconomic Theory)

3. **Advanced Microeconomic Theory**

Students must complete three of the following with at most one from ECON 246, 247, and 248:

ECON 246 (Introduction to Public Economics)

ECON 247 (Topics in Public Economics)

ECON 248 (Topics in Political, Comparative, and Institutional Economics)

ECON 283E (Rational Choice Theory)

ECON 283F (Measurement and Aggregation in Economics)

ECON 283G (General Equilibrium)

ECON 283I (Social Choice and Welfare)

ECON 283J (Uncertainty and Information)

ECON 283K (Special Topics in Microeconomic Theory)

ECON 283N (Application of Games and Information Economics)

4. **Development Economics**

Students must complete three of the following:

ECON 260 (Theories of Economic Development)

ECON 261 (Contemporary Development Strategies)

ECON 262 (Investment, Productivity, and Organizations in Developing Countries)

ECON 263 (Health, Labor and Human Capital in Developing Countries)

ECON 264 (Topics in Economic Development)

ECON 265 (Agricultural and Rural Development)

5. **International Trade Theory/International Finance**

Students must complete three of the following:

ECON 234 (International Trade Theory)

ECON 235 (Topics in International Trade Theory)

ECON 236/POSC 215 (Political Economy of International Finance)

ECON 237 (Topics in International Finance)

6. **Labor Economics**

   Students must complete the following two courses:

   ECON 240 (Labor Demand)

   ECON 241 (Labor Supply)

   And one of the following:

   ECON 242 (Labor Market Equilibrium)

   ECON 243 (Topics in Labor)

   ECON 244 (Empirical Research Methods)

7. **Money, Credit, and Business Cycles**

   Students must complete three of the following:

   ECON 250 (Money, Credit, and the Macroeconomy)

   ECON 251 (Business Cycle Theory)

   ECON 254 (Topics in Money, Credit, and Business Cycles)

8. **Resource and Environmental Economics**

   Students must complete three of the following:

   ECON 207 (Environmental Economics)

   ECON 208 (Models of Nonrenewable Resource Management)

   ECON 209 (Models of Renewable Resource Management)

   ECON 210 (Topics in Environmental Economics)

9. **Public Economics**

   Students must complete either the following three courses:

   ECON 246 (Introduction to Public Economics)

   ECON 247 (Topics in Public Economics)

   ECON 248 (Topics in Political, Comparative, and Institutional Economics)

Not all of these fields and courses are offered every year, offerings depend primarily on student demand. As the department faculty expands, other fields may be added.

Oral Qualifying Examination
Students must pass an oral qualifying examination, which covers a dissertation prospectus and subject matter related to the student's major field and other field courses. It is given by a committee of five faculty members, at least one of whom is not a Department of Economics faculty member. Students are required to take the examination by the end of the third year. The oral qualifying exam can be taken in one of the following modes: in-person, hybrid, or remote. The default mode of the oral qualifying exam is in-person, but the student and their advisor(s) may discuss the option of a hybrid exam given extenuating circumstances, with the advisor(s) making the final determination. The remote option may be chosen only if neither the in- person or the hybrid exam is possible due to unavoidable reasons and requires the approval of the graduate advisor. Students taking the exam in-person are expected to present on campus with all committee members physically present. If the hybrid mode is chosen, the student is expected to present the exam on campus in a video enabled room that supports some members physically present and others remote. The chair of the committee must be physically present for a hybrid exam. If the exam is given remotely, all committee members and student have the option to attend remotely.

Dissertation and Final Examination
The final requirement is the completion of a dissertation, under the direction of a dissertation committee, and passing a final examination defending the dissertation. The dissertation committee is normally composed of three Department of Economics faculty members (including cooperating faculty), usually chosen from the oral qualifying examination committee. Students who enter the program fully prepared normally complete the dissertation by the end of the fifth year. Students are encouraged to present a dissertation prospectus to a meeting of ECON 289 in their third year. The final defense can be taken in one of the following modes: in-person, hybrid, or remote. The default mode of the defense is in-person, but the student and their advisor(s) may discuss the option of hybrid in extenuating circumstances, with the advisor(s) making the final determination. The remote option may be chosen only if neither the in-person or the hybrid exam is possible due to unavoidable reasons and requires the approval of the graduate advisor. Students defending the dissertation in-person are expected to present on campus with all committee members physically present. If the hybrid mode is chosen, the student is expected to defend the dissertation on campus in a video enabled room that supports some members physically present and others remote. The chair(s) of the committee must be physically present for a hybrid defense. If the defense is given remotely, all committee members and student have the option to attend remotely.

Lower-Division Courses

ECON 002 Introduction to Macroeconomics 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): none. An introduction to the study of the economic system from a macro, or aggregate, perspective. Includes analysis of business cycles, economic growth, unemployment, inflation, and the impact of government policies on the level of economic activity. Credit is awarded for one of the following ECON 002 or ECON 002H.

ECON 002H Honors Introduction to Macroeconomics 5 Lecture, 3 hours; discussion, 1 hour; term paper, 3 to 3.5 hours. Prerequisite(s): admission to University Honors. Honors course corresponding to ECON 002. An introduction to the study of the economic system from a macro, or aggregate, perspective. Includes analysis of business cycles, economic growth, unemployment, inflation, and the impact of government policies on the level of economic activity. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of ECON 002 or ECON 002H.

ECON 003 Introduction to Microeconomics 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): none. An introduction to the study of the economic system from the micro, or individual decision-maker's, perspective. Includes the study of opportunity cost, markets, consumption, production, and competition. Credit is awarded for one of the following ECON 003 or ECON 003H.

ECON 003H Honors Introduction to Microeconomics 5 Lecture, 3 hours; discussion, 1 hour; term paper, 3 to 3.5 hours. Prerequisite(s): admission to University Honors or consent of instructor. An introduction to the study of the economic system from a micro, or individual decision-maker's, perspective. Includes the study of opportunity cost, markets, consumption, production and competition. Satisfactory (S) or No Credit (NC) grading is not available. Credit is only awarded for one of ECON 003 or ECON 003H.

ECON 005 Data Analysis For Economics and Business 5 Lecture, 3 hours; research, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H; or consent of instructor. Introduction to the sources of economic and business data and data analysis using graphs, plots, computers, and descriptive statistics. Also covers index numbers, measures of inequality, and simple regression analysis.

ECON 006 Introduction to Environmental Economics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the basic principles of economics and their application to problems of environmental quality and natural resource utilization. Emphasis is on the failure of markets as a cause of environmental degradation and the role of government in resolving problems of resource scarcity. Does not satisfy the Natural Science breadth requirement for the College of Humanities, Arts, and Social Sciences. Cross-listed with ENSC 006.

ECON 060 Engineering Economics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009A. Covers economic decisions involving engineering alternatives. Topics include time value of money, annual cost, present worth, rate of return, and benefit-to-cost. Addresses before and after tax replacement economy, organizational financing, break-even analysis, risk analysis, and capital budgeting. Cross-listed with ENGR 060.

Upper-Division Courses

ECON 101 Statistics For Economics 5
Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour; individual study, 2 hours. Prerequisite(s): MATH 005B or MATH 007A or MATH 009A or MATH 09HA or MATH 022; or equivalent. An introduction to the basic statistical methods for economics. Topics include economic data analysis, index

numbers,univariate and bivariate probability distributions, correlation and regression, sampling distributions, properties of estimators, and hypothesis testing.

ECON 102 Intermediate Microeconomics 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 003 or ECON 003H; MATH 007A or MATH 009A or MATH 09HA or MATH 022. A comprehensive overview of the competitive market system. Includes the modern utility theory of consumer behavior, firm behavior in product and factor markets, and monopoly. Emphasizes theoretical applications to business enterprises. Intended for students planning to major in Business Administration. Credit is awarded for one of the following ECON 102 or ECON 104A.

ECON 103 Intermediate Macroeconomics 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 002 or ECON 002H. Covers the theory of income, employment, price level, and the role of the international economy. Includes fiscal and monetary policy. Intended for students planning to major in Business Administration. Credit is awarded for one of the following ECON 103 or ECON 105A.

ECON 104A Intermediate Microeconomic Theory 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 003 with a grade of C- or better or ECON 003H with a grade of C- or better, MATH 007A or MATH 009A or MATH 09HA. A calculus-based course that develops theories of consumers and firms. Provides the foundation for partial equilibrium study of competitive markets. Explores welfare properties of competitive markets. Credit is awarded for one of the following ECON 104A or ECON 102.

ECON 104B Intermediate Microeconomic Theory 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 102 with a grade of C or better or ECON 104A; MATH 005B or MATH 007A or MATH 009A or MATH 09HA; or consent of instructor. A continuation of ECON 104A that covers monopoly, oligopoly, externalities, and public goods. Develops elementary concepts of game theory. May also cover information economics and economics of uncertainty.

ECON 104C Intermediate Microeconomic Theory 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 104B with a grade of C- or better; or consent of instructor. Extends the partial equilibrium theories of markets and market failure developed in ECON 104A and ECON 104B to factor markets, other market structures, uncertainty and asymmetric information, and time. Develops general equilibrium analysis of the entire economy including welfare economics. Includes many illustrative policy applications.

ECON 105A Intermediate Macroeconomic Theory 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 002 with a grade of C- or better or ECON 002H with a grade of C- or better. Examines the determination of the equilibrium level of national income and its allocation among households, firms, and government. Develops theoretical models that describe how employment, production, and inflation are determined. Focuses on the impact of government policies, as well as the current developments on these issues. Credit is awarded for one of the following ECON 105A or ECON 103.

ECON 105B Intermediate Macroeconomic Theory 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 103 with a grade of "C" or better or ECON 105A. ECON 104A is recommended. A continuation of ECON 103 or ECON 105A. Investigates developments in macroeconomic theory and events. Presents models that explain economic growth and business cycle fluctuations. Explores their empirical relevance and policy implications.

ECON 106 Data Analysis in Economics 4 Lecture, 3 hours; laboratory, 1 hour; individual study, 2 hours; term paper, 1 hour. Prerequisite(s): ECON 101. An introduction to data analytics, visualization, and interpretation. Includes collecting, cleaning, and preparing data for analysis. Uses data to generate and interpret meaningful displays of quantitative and qualitative data. Emphasizes data visualization.

ECON 107 Introductory Econometrics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour; research, 1 hour; written work, 1 hour. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H; ECON 101; or consent of instructor. An introduction to the basic tools of econometrics. Focuses on the issues relating to the linear regression model, including heteroskedasticity, serial correlation, and multicollinearity.

ECON 108 Introductory Econometrics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour; written work, 1 hour; research, 1 hour. Prerequisite(s): ECON 107; or consent of instructor. A continuation of ECON 107. Covers, at an introductory level, the basic concepts related to logit and probit models, panel data methods, instrumental variables, treatment effects, difference in difference models, and simultaneous equations models, among others. Extensive use of econometrics computer software.

ECON 109 Forecasting in Business and Economics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour; written work, 2 hours. Prerequisite(s): ECON 002 or ECON 002H or ECON 003 or ECON 003H; ECON 107; or consent of instructor. Provides a basic knowledge of forecasting and its applications, particularly by using business and economic data. Covers basic methods of forecasting, such as regression methods, exponential smoothing, algorithms, and autoregressive integrated moving average (ARIMA) methods. Also explores how to combine and evaluate various forecasts. Uses computer analysis extensively.

ECON 110 Mathematical Economics 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 104B, MATH 010A, MATH 031. Covers calculus-based and set-theoretic-based mathematical concepts and techniques used in advanced economic analysis, such as optimization theory, probability, expected utility theory, and their applications.

ECON 116 Foundatns-Politcl Econmy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Examines the economic roles of the public sector. Pays particular attention to issues of market failure; government challenges in overcoming market failures; redistributing income; the financing of public sector activities; relationships between federal, state, and local governments; and public choice.

ECON 117 Economics and Philosophy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 104B or consent of instructor. Examines issues on the boundary of economics and philosophy. Topics include social choice theory and economic justice; foundations of utility theory, rational choice, and economic welfare; and epistemology and the philosophies of science of Popper, Kuhn, and others. Cross-listed with PHIL 119.

ECON 119 Law and Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 003 or ECON 003H; or consent of instructor. Examines issues at the intersection of law and economics. Presents the tools needed for an economic analysis of law. Applies the tools to understand the economic logic of the law, especially property, contract, tort, and antitrust law.

ECON 123 American Economic History 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H. Examines the economic history of the United States with an emphasis on the incentives and events surrounding the colonization of modern day United States, the American Revolution, economic growth and expansion throughout the 1800's, the American civil war, and other major historical events leading up to the present. Cross-listed with HISA 123.

ECON 124 World Economic History 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H. Examines economic history with a focus on the innovations, institutions, and events that have helped shape the modern day world.

ECON 125 History of Economic Thought 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H. Study of the development of major economic theories, including those of Adam Smith, Karl Marx, and John Maynard Keynes. Focus is on how alternative theories define and address economic problems differently and the policy implications that follow.

ECON 129 Health Economics 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. Analyzes the demand and supply of health care. Uses economic models to analyze health care choices of individuals. Covers the market for health insurance and the behavior of for-profit and not-for-profit health care providers regarding price, quantity, and service quality under

various market structures.

ECON 130 Introduction to Money, Banking, and Credit 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ECON 103 or ECON 105A. Covers the basic theories of modern monetary systems. Explores money, credit, and interest rate behavior; financial intermediation and central banking; and methods and objectives of monetary and regulatory policy.

ECON 132 Public Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. Considers the economics of current policy debates including healthcare, social security, tax policy, and private support for public schools. Focuses on government as an institution that corrects market inefficiencies and inequities. Examines government decision making from the perspectives of social choice theory, cost-benefit analysis, and the financing of government expenditures.

ECON 134 Introduction to Financial Management 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BUS 020; ECON 003 or ECON 003H; STAT 008 or ECON 101; or equivalent; or consent of instructor. An introduction to financial management and financial institutions. Includes time value of money, stock and bond valuation, risk and return, portfolio theory, capital budgeting, capital structure, dividend policy, and financial databases. Cross-listed with BUS 106. Credit is awarded for one of the following BUS 106, ECON 134, or BUS 133.

ECON 135 The Stock Market 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H. ECON 103 or ECON 105A is strongly recommended. An analysis of the history of the stock market and its role in the macroeconomy. Topics include factors governing stock prices, fundamental and technical analysis, the impact of inflation and interest rates, international investing, and the role of social institutions in the determination of stock prices.

ECON 136 Empirical Financial Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 107 or consent of instructor. Discusses various empirical aspects of financial economics and financial risk management. Addresses both theoretical and applied issues in finance, risk management, and econometrics. Also discusses quantitative analysis, simulation methods, and case studies.

ECON 137 Economic Growth and Unemployment 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 103 or ECON 105A; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Studies two central issues in macroeconomics: economic growth and unemployment. Begins with understanding the historical data and stylized facts in the U.S. economy. Examines theoretical models that analyze economic growth and unemployment. Investigate the empirical relevance and policy implications of these models.

ECON 138 Economics of Financial Investments 4 Lecture, 3 hours; written work, 1.5 hours; individual study, 1.5 hours. Prerequisite(s): ECON 002 with a grade of C- or better or ECON 002H with a grade of C- or better; ECON 003 with a grade of C- or better or ECON 003H with a grade of C- or better. Applies economic tools to debt obligations such as student loans and mortgages. Discusses utility-maximizing investment strategies and traditional retirement plans. Studies the economics of emerging asset classes such as cryptocurrencies and blockchain technology. Focuses on navigating web 3.0 and decentralized cryptocurrency exchanges.

ECON 143 Environmental Economics 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): ECON 003 or ECON 003H; or equivalent; or consent of instructor. An introduction to economic analysis of natural resources, the environment, and environmental quality. Topics include interactions between the environment and the economy, social choice theory, source control costs, damage valuation, efficient pollution control, and design of efficient and equitable environmental policy.

ECON 146 Urban Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. Applies basic microeconomic principles to the spatial concentration of economic activity, the operation of the urban land, housing, transportation, and labor markets, the role of government in the urban economy, and urban economic problems, including pollution, crime, and homelessness. Cross-listed with URST 146.

ECON 148 Land and Resource Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. Explores distinctive qualities of land and its rent, as well as valuation of land as an investment. Addresses assembly, division, and development of land, efficiency of the land market and the effects of taxation. Covers concentrated ownership, separation of ownership and management, rent and taxable surplus, and origins and kinds of tenure.

ECON 150 Rockonomics: Topics in Applied Microeconomics Through the Lens of the Music Industry 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 003 or ECON 003H; or consent of instructor. Covers topics in applied microeconomics as they relate to the music industry. Explores questions related to consumption, pricing and price discrimination, market structure and competition, technological change, labor supply of musicians, superstar markets, uncertainty and portfolio theory, and human capital. Also addresses behavioral economics topics including preference formation and durability.

ECON 151 Econmics of Education 4 Lecture, 3 hours; individual study, 6 hours; written work, 3 hours. Prerequisite(s): ECON 003 with a grade of C- or better or ECON 003H with a grade of C- or better; ECON 101 with a grade of C- or better. Focuses on the benefits and costs of education, educational inputs, and educational policy. Applies economic theory to the study of education. Evaluates empirical evidence of issues relating to education. Develops communicating reasoned and informed prescriptions and/or evaluations of education policy.

ECON 152 Cost-Benefit Analysis With Applications to Public Policy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 104A; restricted to class level standing of junior, or senior; or consent of instructor. Provides the economic foundations and practical tools to conduct cost benefit analysis. Discusses predicting and monetizing impacts of economic policies, as well as discounting future impacts. Also focuses on dealing with uncertainty, value of information, and social welfare.

ECON 153 Labor Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. An analysis of labor demand, labor supply, market equilibrium, and policies affecting each. Topics include labor supply, labor demand, minimum wages, government transfers, education, job training, and discrimination. Cross-listed with BUS 153.

ECON 155 Women's Labor and the Economy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. A special-topics based labor economics course. Focuses on one important dimension of worker differences: gender. Covers the topics of human capital, wages and employment, occupational choice, discrimination, the family as an economic unit, and public policy. Cross-listed with GSST 155, and PBPL 155.

ECON 157 Labor in the Public Sector 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. A labor economics course on employment in the public sector. Explores questions of wages and contract structuring, recruitment, training, risk, collective bargaining, licensing, rent-seeking and corruption, and influence in the public sector. Cross-listed with PBPL 157.

ECON 158 Economic Mobility in the United States 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 101. Exploration of economic mobility in the United States. Topics include measures of economic mobility, regional variation in economic mobility, and policies intended to increase economic mobility.

ECON 160 Industrial Organization 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 104B. A study of the organization and structure of the American industrial system. Emphasizes production and pricing behavior and policies. Also addresses market structure and public policies regulating or influencing market behavior. Cross-listed with BUS 160.

ECON 162 Managerial Economics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ECON 102 or ECON 104A. Examines applications of economic analysis to problems of management, especially of capital. Emphasis is on production economics and cost analysis. Cross-listed with BUS 162.

ECON 163 Introduction to Game Theory 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 101; ECON 104B. Introduces and develops basic concepts of game theory to study strategic interactions, with examples and applications drawn from Economics and other social sciences.

ECON 164 Behavioral Economics 4 Lecture, 3 hours; extra reading, 1 hour; individual study, 1.5 hours; term paper, 0.5 hour. Prerequisite(s): ECON 002 or ECON 002H; ECON 104B. An introduction to core concepts in behavioral economics. Includes choice under uncertainty, choice over time, social preferences, and transaction utility. Outlines the role of lab and field experiments in the discipline. Discusses applications to management, marketing and charitable giving, and the use of behavioral economics in designing policy.

ECON 171 International Finance 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 103 or ECON 105A. Covers international monetary theory and its applications. Topics include balance of payments, exchange rates, open-economy macroeconomics, and international monetary institutions. Addresses selected policy issues.

ECON 173 Global Poverty 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H. Examines poverty around the world in a comparative perspective. Topics include concepts of poverty, measurement of poverty, and policies intended to reduce poverty. The regions studied include the U.S., other developed countries, and developing countries. Credit is awarded for one of ECON 173 or ECON 173S.

ECON 173S Global Poverty 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H. Examines poverty around the world in a comparative perspective. Topics include concepts of poverty, measurement of poverty, and policies intended to reduce poverty. The regions studied include the U.S., other developed countries, and developing countries. Credit is awarded for only one of ECON 173 or ECON 173S.

ECON 175 Comparative Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the roles of different economic, political, legal, financial, fiscal, and informal institutions in the economy. Topics also include the theoretical traditions of the debate between market and plan and of the boundaries of market and hierarchy.

ECON 178 International Trade 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. A study of the pure theory of trade, trade policy, and international factor movements. Includes illustrative applications to current issues and problems. Cross-listed with BUS 178.

ECON 181 Economic Development: Theory and Policy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H. A survey of the main theories of economic development and an analysis of the major development strategies and policies.

ECON 182 Trade, Globalization, and Development 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H. Explores global development with an emphasis on empirical results regarding the effectiveness of foreign aid, trade, property rights, and other institutions that can influence economic growth. Analyzes the nature and consequences of globalization on individuals, countries, and the world economy.

ECON 183 Population and Development 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A; ECON 107; or consent of instructor. A study of interactions between population growth and economic development. Covers the history of demographic thought, models for developing countries based on the demographic experience of currently developed countries. Explores household production models, demand for children, mortality, health and nutrition, migration, and human capital. Traces macroeconomic economic-demographic linkages in developing countries.

ECON 185 Economic Development in Latin America 4 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 103 or ECON 104A or ECON 105A. A comparative analysis of the major trends in Latin American economies in the twentieth century. Includes historical legacies, primary export economies, the theory and practice of import substitution industrialization, and the debt crisis. Also covers stabilization and structural adjustment, poverty and income distribution, the informal and agricultural sectors, and the environment. Cross-listed with LNST 185.

ECON 186 Policy Evaluation in Development Economics 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): ECON 003 or ECON 003H; or consent of instructor. An overview of randomized impact evaluation as a tool of the causal revolution in development economics. Introduces experimental methods and covers the application of those methods to conducting impact evaluations in a range of development settings including education, health, labor, and economics of the firm, microfinance, environment, and political economy. Cross-listed with PBPL 186.

ECON 187 Contemporary Public Policy Challenges in Latin America 4 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H; consent of instructor. A survey of the wide-sweeping policy reforms since the 1980s and of contemporary public policy challenges in Latin America. Challenges discussed include extremely high levels of poverty and inequality; inadequate educational and healthcare systems; pressures for land reform; problems of trade competitiveness; and recurring currency crises. Cross-listed with LNST 187.

ECON 188 The Chinese Economy 4 Lecture, 3 hours; individualized study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H or ECON 003 or ECON 003H; Restricted to class level standing of junior, or senior. An introduction to the Chinese economy, with a focus on the economic reform since 1978. Topics include the economic and political logic behind the reform, the lessons learned from the reform, China's evolving role in the world economy, and the challenges that China is currently facing.

ECON 189 Economic Development in Brazil 4 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A; ECON 103 or ECON 105A. An analysis of the successes and failures of economic development in the largest country in Latin America. Reviews current issues facing Brazilian policy makers. Topics include historical legacies, import substitution and industrialization, poverty and inequality, agriculture and land reform, and the environmental impact of development. Cross-listed with LNST 189.

ECON 190 Special Studies 1 to 5 Activity, 3 to 15 hours. Prerequisite(s):upper-division standing; consent of instructor and program chair A project to be undertaken under faculty supervision. Course is repeatable to a maximum of 12 units.

ECON 193A Senior Seminar 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 101, ECON 104A with a grade of B+ or better or ECON 105A with a grade of B+ or better; or consent of instructor. Advanced research in various fields of faculty interest. Includes completion of a research paper and presentation. Topics vary from year to year.

ECON 193B Senior Seminar 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 193A; or consent of instructor. Advanced research in various fields of faculty interest. Students complete a research paper and present their results in the seminar. Topics vary from year to year.

ECON 198I Individual Internships in Economics 1 to 12 Internship, 3 to 36 hours. Prerequisite(s): Restricted to class level standing of junior, or senior; and consent of instructor. Active participation in the work of a public or quasi-public agency or business concern in matters relating to general or business economics. Academic requirements set by the instructor. Course is repeatable as content or topic changes to a maximum of 16 units.

ECON 199H Senior Honors Research 1 to 4 Research, 3 to 12 hours. Prerequisite(s): upper-division standing in Economics; admission to University Honors or consent of instructor. Offers the opportunity for directed research at an honors level. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 12 units.

Graduate Courses

ECON 200A Microeconomic Theory 6
Lecture, 4.5 hours; discussion, 2 hours. Prerequisite(s): ECON 104B; or equivalent; graduate standing. Focuses on consumer and producer theory under conditions of certainty. Covers required mathematics including real analysis and static optimization theory. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ECON 200B Microeconomic Theory 4
Lecture, 3 hours; discussion, 1.5 hours. Prerequisite(s): ECON 200A; or equivalent; graduate standing. Focuses on decision making under uncertainty, economics of information, applications of game theory, and models of imperfect competition.

ECON 200C Microeconomic Theory 4
Lecture, 3 hours; discussion, 1.5 hours. Prerequisite(s): ECON 200B; or equivalent; graduate standing. Focuses on general equilibrium theory including existence and stability. Also covers welfare economics and social choice.

ECON 201A Macroeconomic Theory 4
Lecture, 3 hours; discussion, 1.5 hours. Prerequisite(s): ECON 105B, ECON 200A, may be taken concurrently; or equivalent; graduate standing. Examines the basic issues and models of macroeconomics.

ECON 201B Macroeconomic Theory 4
Lecture, 3 hours; discussion, 1.5 hours. Prerequisite(s): ECON 201A; or equivalent; graduate standing. Covers, but is not limited to, investment and consumption, labor and monetary economics, tax and debt policy, and mathematics for macroeconomists.

ECON 201C Macroeconomic Theory 4
Lecture, 3 hours; discussion, 1.5 hours. Prerequisite(s): ECON 201B; or equivalent; graduate standing. Focuses on the phenomena of business cycles including the empirical characteristics and the theoretical models.

ECON 202 Topics in Economic Theory: Critiques and Alternative Approaches 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s); graduate standing. Critiques of conventional economic theories and consideration of alternative theories and approaches to issues of aggregate economic growth and instability from Marx to the present.

ECON 205A Econometric Methods I 4
Lecture, 3 hours; discussion, 1.5 hours. Prerequisite(s): ECON 104A; ECON 105A; MATH 009A; MATH 009B; STAT 011; or equivalents; graduate standing. Examines econometric methods for the analysis of economic data and the construction of econometric models with applications to microeconomics and macroeconomics. Covers the linear regression model and related techniques of matrix algebra. Also addresses statistical estimation and inference.

ECON 205B Econometric Methods II 4
Lecture, 3 hours; discussion, 1.5 hours. Prerequisite(s): ECON 205A; or equivalent; graduate standing. Examines econometric methods covering extensions of the basic regression model, nonlinear models, and limited dependent variable models.

ECON 205C Econometric Methods III 4
Lecture, 3 hours; discussion, 1.5 hours. Prerequisite(s): ECON 205B; or equivalent; graduate standing. Examines econometric methods for the analysis of economic data and the construction of econometric models with applications to time-series macroeconomics. Covers univariate time-series models, volatility models, simultaneous equation models, and dynamic econometric models.

ECON 207 Environmental Economics 4
Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 200A; graduate standing; or equivalent. Covers the theory and methods of environmental economics. Topics include externality theory, bargaining solutions, property rights, and resource allocation mechanisms. Also covers environmental policy under uncertainty and asymmetric information, as well as dynamic and general equilibrium models of environmental quality.

ECON 208 Natural Resource Economics 4
Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 200A or equivalent; graduate standing. Covers dynamic models of nonrenewable resources. Topics include uncertainty, game theory, and the measurement of resource scarcity. Examines empirical models of nonrenewable and renewable resources.

ECON 209 Nonmarket Valuation and Environmental Policy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 200A; ECON 205A or equivalent; graduate standing. A study of economic valuation of natural resources and the environment. Includes environmental demand theory, travel cost models, random utility models, discrete choice models, the contingent valuation technique, and hedonic wage and pricing models. Also covers theory, empirical methods, and applications.

ECON 210 (E-Z) Topics in Environmental Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 207; graduate standing. An in-depth study in selected areas of environmental and natural resource economics. E. Transportn & Envrnmntl Quality; F. Politicl Econ Of Environ Polic. Course is repeatable to a maximum of 8 units.

ECON 214A Applied Microeconomics 1 4
Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Provides a foundation in economic theory and empirical tools used by economists to examine economic issues. Emphasizes practical application of economic theory to topics commonly addressed by economists working in government, the private sector, and non-profits.

ECON 214B Applied Microeconomics 2 4
Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 214A; graduate standing. Continues to develop a foundation of theory and empirical tools to analyze complex decisions addressed by economists working in government, the private sector, and non-profits. Emphasizes the economic theory of decision making, game theory, and an introduction to cost-benefit analysis.

ECON 215A Applied Macroeconomics 1 4
Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces graduate macroeconomic topics through theory and applied techniques. Topics include the supply and demand of factors of production, business cycles and unemployment, fiscal policy and its effect on the national budget, monetary policy and inflation, and modeling an open economy in the short run.

ECON 215B Applied Macroeconomics 2 4
Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 215A; graduate standing. Continues to develop the theoretical and applied foundations of macroeconomic analysis. Topics include exogenous and endogenous growth, determinants of structural unemployment, the influence of institutions on long-term economic development, and an introduction to forecasting.

ECON 216A Applied Econometrics 1 4
Lecture, 3 hours; individual study, 2 hours; laboratory, 1.5 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces econometric techniques used to analyze data in economics, business, and government. Topics include estimating simple and multiple regressions, interval estimation and hypothesis testing, dummy variables, heteroskedasticity, multicollinearity, instrumental variables, and estimation of cross-sectional and panel data models.

ECON 216B Applied Econometrics 2 4
Lecture, 3 hours; individual study, 2 hours; laboratory, 1.5 hours. Prerequisite(s): ECON 216A; graduate standing. Extends and refines the econometric techniques and knowledge gained in ECON 216A. Topics include regression analysis with time series data, panel data methods, spatial econometric models, diagnostic testing, nonparametric kernel methods, and vector autoregressions.

ECON 217 Professional Development 2
Lecture, 1.5 hours; individual study, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Enhances the usefulness of the economics learned in the program by promoting skills related to leadership, oral and written communication, teamwork, organizing and managing projects, negotiation, conflict resolution, and professional conduct. Course is repeatable to a maximum of 6 units.

ECON 218A Capstone 1 2 Lecture, 1.5 hours; individual study, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. First of a two-part sequence that presents the initial steps leading to a final capstone project. Includes defining the problem; assembling the evidence; constructing alternative solutions; and selecting criteria for evaluating the solutions.

ECON 218B Capstone 2 2 Lecture, 1.5 hours; individual study, 2 hours. Prerequisite(s): ECON 218A; graduate standing. Second of a two-part sequence that builds on progress made in ECON 218A. Completes the final capstone project by confronting the outcomes; confronting the trade-offs; implementing the

concept of Stop-Narrow-Focus-Decide; and telling your story.

ECON 219 Financial Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 214A, ECON 216A; graduate standing. Provides an overview of modern finance including individual investment decisions under uncertainty, mean variance theory, capital market equilibrium, arbitrage pricing theory, incomplete markets, and empirical patterns of risk and return in financial markets.

ECON 220 Big Data in Economics 4 Lecture, 3 hours; individual study, 2 hours; laboratory, 1.5 hours. Prerequisite(s): ECON 216A; or equivalent; graduate standing. Introduces machine learning tools for big data analysis in economics. Focuses on critical toolkits (methods and softwares) and applications to big data in economics. Topics include regression and classification, regularization, resampling methods, decision trees, boosting, and deep learning. Credit is awarded for one of the following ECON 220 or STAT 208.

ECON 221 Forecasting For Economics, Finance and Business 4 Lecture, 3 hours; individual study, 3 hours; laboratory, 1.5 hours. Prerequisite(s): ECON 216B; graduate standing. Introduction to the methods and practice of forecasting. Focuses on the analysis of linear time series models and the construction of optimal forecasts emphasizing forecasting uncertainty and the construction of density forecasts. Illustrates the application of forecasting methods through simulation exercises and exercises with real economic and financial data.

ECON 222 Public Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 214A, ECON 216A; graduate standing. Provides a broad overview of the microeconomics of the public sector. Applies microeconomics and microeconometrics to the study of federal, state, and local tax policy, expenditures, and transfer programs. Also addresses current policy issues.

ECON 225 Urban Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 214A, ECON 216A; graduate standing. An advanced analysis of city formation and spatial equilibrium that applies theoretical characterizations to policy decisions and current events. Applied topics include housing policy, poverty, transportation, labor productivity, and crime. Provides guidance on how to collect and analyze data to understand urban economic issues.

ECON 226 Applied Environmental Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 214A, ECON 216A; graduate standing. Provides the theoretical and empirical foundations for studying environmental issues, data, and policy. Focuses on sources of market failure as it relates to the environment, cost-benefit analysis, sustainable economic development, the economics of renewable and non-renewable resources, and the impact of environmental policy. Credit is awarded for one of the following ECON 226 or PBPL 233.

ECON 227 Cost Benefit Analysis 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 214A, ECON 216A; graduate standing. Introduces the tools and practice of cost-benefit analysis. Focuses on the use of economic theory for conducting public policy assessment. Topics include predicting and monetizing impacts of economic policies, value of information, and social welfare.

ECON 228 Behavioral and Experimental Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 214A, ECON 216A; graduate standing. An introduction to behavioral economics concepts as applied to consumer purchasing decisions, information and uncertainty, intertemporal choice, and strategic interaction. Covers the applications of behavioral economics principles to firms and public policy as well as the growing use of experiments in the field.

ECON 229 Mathematical Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 214A, ECON 214B; graduate standing. Introduction to mathematical methods in economics and their applications for economic theories. Topics include theories of optimization, market equilibria, risk and uncertainty, and strategic games. Also covers formal concepts from mathematics including topology, probability theory, and fixed point theory as fundamental tools to study economic theories.

ECON 230 Economic Development Theory, Applications, and Policy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 214A, ECON 216A; graduate standing. Provides an understanding of the major theories, key empirical findings, and policy debates in the field of economic development. Covers economic growth, poverty and inequality, population, health, human capital accumulation, institutions, and political economy.

ECON 231 Randomized Evaluation in Development Policy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 214A, ECON 216A; graduate standing. Covers experimental methods and their application to impact evaluations of programs and policies in developing countries. Examines applications to education, health economics, economics of the firm, microfinance, labor markets, and political economy. Provides an overview of aid in development, policy challenges in developing countries, and other approaches to impact evaluation.

ECON 234 International Trade Theory 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 200A, ECON 200B, ECON 200C; or consent of instructor. Examines the determinants of trade in goods and services, international flow of labor and capital, and the effects of trade policy on welfare and income distribution.

ECON 235 Topics in International Trade Theory 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): Prerequisite(s) ECON 234 or consent of instructor. An in-depth study in selected areas of international trade theory. Topics include, but are not limited to, trading blocks, trade agreements and strategic interactions, trade and the environment, and the political economy of international trade.

ECON 236 Political Economy of International Finance 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Conducts a broad theoretical and historical survey of the politics and economics of international money and finance. Topics include monetary and exchange rate regimes, foreign direct investment, capital flows, sovereign debt, financial regulation and international macroeconomic coordination, the role of finance in economic development, and international financial crises. Cross-listed with POSC 215.

ECON 237 Topics in International Finance 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores key topics in international finance and open economy macroeconomics using both theoretical and empirical analysis tools. Topics include the understanding of exchange rate determination, current account, international capital flows, currency crisis, foreign exchange intervention, and sovereign debt/risk.

ECON 240 Labor Demand 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Establishes a theoretical foundation for the study of labor demand. Exposes both essential and current research in topics related to labor demand. Begins the process of generating research ideas in labor economics.

ECON 241 Labor Supply 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the quantity and quality of labor supply. Provides a rich understanding of labor supply and human capital theory; develops econometric skill to evaluate empirical evidence of the predictions that theory affords; and discusses the art of connecting theory to empirical analysis.

ECON 242 Labor Market Equilibrium 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Establishes a theoretical foundation for the study of equilibrium in labor markets and builds exposure to essential and current research in the field. Topics may include crime, migration, market structures, and personnel economics.

ECON 243 Topics in Labor 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. In-depth study in selected areas of labor economics. Topics include, but are not limited to, economic demography and race and gender issues.

ECON 244 Empirical Research Methods 4 Lecture, 3 hours; tutorial, 1 hour; written work, 2 hours. Prerequisite(s): ECON 205B or equivalent. Introduction to empirical techniques used in modern applied economics, with a focus on identification strategies. Topics include natural experiments, instrumental variables, regression discontinuity, and panel data. Emphasis is

on practical application of techniques and solutions to problems empirical researchers encounter.

ECON 246 Introduction to Public Economics 4 Lecture, 3 hours; written work, 2 hours; extra reading, 1 hour. Prerequisite(s): ECON 200C. An introduction to public economic theory and its applications: Topics include the theory of economic justice, welfare economics, the theory of market failure, the positive theory of taxation, and cost-benefit analysis.

ECON 247 Recent Advances in Public Economics 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ECON 200C; graduate standing. An in-depth study of selected topics in public economics. Topics include, but are not limited to, applied general equilibrium analysis and optimal government policy, comparative institutional analysis, political economics, social choice, urban and transportation economics, and empirical public economics. Course is repeatable to a maximum of 8 units.

ECON 248 Topics in Political, Comparative, and Institutional Economics 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ECON 200C; graduate standing; or consent of instructor. An in-depth study of selected topics in political, comparative, and institutional economics. Topics include general interest politics, special interest politics, and agency models of politics; comparative analysis of coordination, legal, financial, fiscal, and political institutions; economics of culture and economics of political and economic transitions. Course is repeatable to a maximum of 8 units.

ECON 250 Money, Credit, and the Macroeconomy 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Investigation of the role of money, credit, and financial institutions in influencing growth, distribution, employment, prices, and business cycles in capitalist economies. Fiscal policy, monetary policy, and public investments are addressed from alternative theoretical perspectives.

ECON 251 Business Cycle Theory 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An in-depth treatment of theories of the cycle and empirical data on relations of variables over the cycle.

ECON 254 Topics in Money, Credit, and Business Cycles 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Selected topics in the performance of the macroeconomy, monetary and fiscal theory, and monetary and fiscal policy.

ECON 260 Theories of Economic Development 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A survey of the major theories of development and underdevelopment beginning with the classical model, theories of surplus, and including the models of Lewis, Nurkse, Hirschman, neoclassical schools, structuralist models, and dependency theory.

ECON 261 Contemporary Development Strategies 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A review of the performance of the major strategies of development implemented in the recent past or currently under implementation.

ECON 262 Investment, Productivity, and Organizations in Developing Countries 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers the causes of established inefficiencies in firms and public sector organizations in developing countries as well as emerging solutions to address sub-optimal outcomes. Addresses microcredit, savings, capital, employment, management, personnel economics, technology adoption, markets and firm cooperation, compliance with regulation, and corruption. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ECON 263 Health, Labor and Human Capital in Developing Countries 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Topics include but are not limited to: early life health and human development; education and human capital accumulation; labor market returns to health and human capital; labor supply; discrimination; and economic demography.

ECON 264 Topics in Economic Development 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Selected themes for advanced study in economic development. Course is repeatable to a maximum of 8 units.

ECON 265 Agricultural and Rural Development 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. This course is concerned with the economics of agricultural and rural development in developing countries. Topics examined include technical change, sharecropping and interlinked factor markets, migration, poverty and famine, land reform, environmental aspects of rural development, and structural adjustment within agriculture.

ECON 272A Political Economy: Marxian Economics 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A study of Marxian economic theory, including historical materialism, the role of value, class, exploitation, and accumulation in Marxian economics, and a survey of current debates on these issues.

ECON 272B Political Economy: Efficiency, Justice, and Power 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers the various notions of efficiency used in political economic analysis, as well as their application in historical and comparative institutional contexts. Theories of justice in the distribution of rewards and the extent to which efficiency is separable from justice. Different notions of how power influences economic outcomes.

ECON 275 Health Economics I: Demand 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Reviews the structure and intuition of economic models used to analyze people's choices about their health and health care. Emphasizes that health is a cumulative process of investment. Also analyzes the market for health insurance.

ECON 282 (E-Z) Advanced Macroeconomic Theory 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Covers advanced topics in macroeconomic theory. Students read state-of-the-art research papers and books. Includes presentations by students and faculty. E. Foundations Of Macroeconomics; F. Advanced Monetary Theory; G. Special Topics In Macroeconomic Theory. Course is repeatable to a maximum of units.

ECON 283 (E-Z) Advanced Microeconomic Theory 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Covers advanced topics in microeconomic theory. Involves reading current research papers and books, and presentations by students and faculty. E. Rational Choice Theory; F. Measurement And Aggregation In Economics; G. General Equilibrium; I. Social Choice And Welfare; J. Uncertainty And Information; K. Special Topics In Microeconomic Theory; M. The Microtheoretic Bases Of Development Economics; N. Applications Of Games And Information Economics; O. Measurement Of Productivity And Efficiency; P. Public Economic Theory; Q. Economics Of Contract: Theory And Applications; R. Measurement Of The Standard Of Living, Inequality, And Deprivation. Course is repeatable to a maximum of units.

ECON 285 (E-Z) Advanced Econometrics 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Advanced topics and recent developments in econometrics. Includes readings of state-of-the-art research papers and books as well as student and faculty presentations. ECON 285F is repeatable to a maximum of 8 units. E. Advanced Econometric Methods; F. Topics In Econometrics; G. Applied Econometrics; I. Macroeconometrics; J. Nonparametric Econometrics; K. Microeconometrics; M. Advanced Time Series Econometrics.

ECON 289A Colloquium in Economics 2 Seminar, 1.5 hours; written work, 1.5 hours. Prerequisite(s): graduate standing. Lectures and discussion by students, faculty and invited scholars on specially selected topics. Course is repeatable up to a maximum of 8 units.

ECON 289B Colloquium in Economics 2 Seminar, 1.5 hours; written work, 1.5 hours. Prerequisite(s): graduate standing. Lectures and discussion by students, faculty and invited scholars on specially selected topics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ECON 290 Directed Studies 1 to 6
Prerequisite(s): graduate standing and consent of instructor. Directed studies of selected problems of economic analysis. Open to graduate students who desire to do special work in a particular field. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ECON 291 Individual Study in Coordinated Areas 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing. A program of study designed to advise and assist candidates who are preparing for examination. Graded Satisfactory (S) or No Credit (NC). Repeatable as follows: (1) a student may take up to 12 units prior to the award of the M.A. (these 12 units do not count toward the required M.A. units); (2) a student may take up to 18 additional units after award of the M.A. but prior to successful completion of the Ph.D. qualifying examination.

ECON 292 Concurrent Analytical Studies 2 to 4 Lecture, 1 to 3 hours; research, 6 to 12 hours. Prerequisite(s): consent of instructor. Each 292 course will be taken concurrently with some 100-series course, but on an individual basis. It will be devoted to completion of a graduate paper based on research or criticism related to the 100-series course. Faculty guidance and evaluation will be provided through the quarter. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

ECON 297 Directed Research 1 to 6
Prerequisite(s): graduate standing and consent of instructor. Directed research on selected problems in economics. Designed for graduate students who have not yet passed their qualifying examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ECON 299 Research For Thesis Or Dissertation 1 to 12 Prerequisite(s): graduate standing and consent of instructor. Research in economics under the direction of a staff member to be included as part of the doctoral dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Course

ECON 302 Teaching Practicum 1 to 4
Practicum, 3 to 11 hours; seminar, 1 hour. Prerequisite(s): limited to department TAs; graduate standing. Supervised teaching in upper- and lower-division courses. Required of all economics teaching assistants. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

School of Education

Subject abbreviation: EDUC
School of Education

Joi A. Spencer, Ph.D., Dean
Joseph Kahne, Ph.D., Associate Dean and Chair for Academic Personnel
Eddie Comeaux, Ph.D., Associate Dean for Graduate Education and Graduate Advisor
Raquel M. Rall, Ph.D., Associate Dean for Strategic Initiatives
Austin H. Johnson, Ph.D., Associate Dean for Undergraduate Education
Sally Tavizon, M.A, Assistant Dean and Chief Financial & Administrative Officer
Frances Valdovinos, Ed.D., Assistant Dean and Director of Teacher Education

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Professors

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Begoña Echeverria, Ph.D.
Joseph Kahne, Ph.D., *Distinguished Professor Ted and Jo Dutton Endowed Presidential Chair for Education Policy and Politics*
Rita Kohli, Ph.D.
Joi A. Spencer, Ph.D.
Robert K. Ream, Ph.D.
Louie F. Rodriguez, Ed.D.
Tara J. Yosso, Ph.D.

Professors Emeriti

Irving H. Balow, Ph.D.
Janet B. Blacher, Ph.D.
Steven T. Bossert, Ph.D.
Robert C. Calfee, Ph.D.
Jerry S. Carlson, Ph.D.
James T. Dillon, Ph.D.
Dan M. Donlan, Ph.D.
Sharon A. Duffy, Ph.D.
V.P. Franklin, Ph.D.
Cassandra Guarino, Ph.D.
E. Mark Hanson, Ph.D.
Irving G. Hendrick, Ed.D.
Asha K. Jitendra, Ph.D.
John S. Levin, Ed.D.
Donald L. MacMillan, Ed.D.
Douglas E. Mitchell, Ph.D.
Margaret Nash, Ph.D.
Richard S. Newman, Ph.D.
Rollanda E. O'Connor, Ph.D.
Flora I. Ortiz, Ph.D.
Reba N. Page, Ph.D.
Melanie Sperling, Ph.D.
H. Lee Swanson, Ph.D.
Keith Widaman, Ph.D.
John S. Wills, Ph.D.

Associate Professors

Kinnari Atit, Ph.D.
Eunsoo Cho, Ph.D., *Eady Endowed Chair in Special Education*
Marsha M. Ing, Ph.D.
Uma M. Jayakumar, Ph.D.
Austin H. Johnson, Ph.D.
Eui Kyung Kim, Ph.D., NCSP, PPS
Alice Y. Lee, Ph.D.
Katherine Meltzoff, Ph.D.
Gregory Palardy, Ph.D.
Soojin Park, Ph.D.
Raquel M. Rall, Ph.D.
Blanca Rincón, Ph.D.
Michael Solis, Ph.D.
Rican Vue, Ph.D.

Assistant Professors

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Avriel Epps, Ph.D.
Suneal Kolluri, Ph.D.
Stephanie Moore, Ph.D., NCSP
Michael W. Moses II, Ph.D.
Anthony Muro Villa III, Ph.D.
Wesley A. Sims, Ph.D.

Associate Professor of Teaching

Carlos O. Calderón, Ph.D.
Catherine Lussier, Ph.D.
Miguel Zavala, Ph.D.

Assistant Professors of Teaching

Lorena Gutierrez, Ph.D.
Amos Lee, Ph.D.

**

Cooperating Faculty

Kēhaulani Vaughn, Ph.D. (Ethnic Studies)

Associate Adjunct Professor

Brian L. Haynes, Ph.D.

Assistant Adjunct Professors

Elizabeth Claassen-Thrush, Ph.D.

Supervisors of Teacher Education

Brenda Burgo, Ph.D.
Parissa Clark, Ph.D.
Karen Dodson
Denise Edwards, Ed.D.
Courtney Kane, Ed.D.
D. Patrick Johnson
La-Trice Johnson, Ed.D.
Mayeen Quader, Ph.D.
S. Paul Rosenzweig, Ph.D.
Michelle L. Stockdale
Nancy Butler Wolf, Ph.D.

Education, Society and Human Development Major

The Education, Society, and Human Development Major builds a theoretical foundation, presents applied understandings in the study of education, and explores the varied contexts of learning over the life course.

Program faculty bring multiple disciplinary perspectives to their research and courses, including cognitive sciences, developmental psychology, understanding of the exceptional child, applied behavior analysis, the relationship between education, society and culture, educational policy and leadership, measurement and assessment, and issues in higher education.

Students will benefit from completing the major because they will be exposed to critical theories that investigate how education has been used to create, maintain, and reinforce social stratification. In addition, students will develop a historical and contemporary awareness of different learning settings, and gain a strong foundation in human development, assessment and interventions in the education context. Students who are interested in teaching elementary, middle, or high schools should consult an academic advisor in the SOE Undergraduate Programs Office about combining an appropriate major and minor or

completing a double major in order to develop appropriate expertise in the subject they plan to teach.

Education, Society, and Human Development majors are also prepared for other types of instructional, administrative or advocacy positions in programs or organizations such as those focused on early childcare, out-of-school learning, or adult learning. Additionally, students who complete the major are prepared to enter education-related career fields in the private, non-profit, and public sectors including working with special populations, in legal fields, medical environments, and the arts. Students interested in graduate study will be well prepared to pursue advanced degree programs in education or related fields. Undergraduates enrolled in the Education, Society, and Human Development degree are encouraged to complete courses inside and outside of the major to enhance career preparation and pursue personal interests. With advanced planning, students in the major can complete a minor or a second major in another discipline. The B.A. in Education, Society, and Human Development is not a teacher credential program. (See School of Education section on Teaching Credentials and Masters programs.)

First-Year Student Seminars

The EDUC 093A, EDUC 093B, and EDUC 093C courses are a year-long seminar series designed for first-year students that meets weekly with several aspirations including community building, orientation to the campus and the major, and academic support. The long-term goal of this seminar series is to not only set the foundation for the major but to build an experience that evolves over the course of students' experience at UCR.

The seminars are for first-year students in the Education, Society, and Human Development major; first-year students are given enrollment priority. The fall seminar carries 2 units of academic credit. The winter and spring courses carry 1 unit of academic credit each. The units are not applied toward major requirements, however the units count toward overall degree completion. The seminar series is recommended, but not required for completion of the degree. The seminars are graded on an "S/NC" basis.

Transfer Student Seminar

The EDUC 094 course is a 2-unit seminar (designed for new, incoming transfer students) that meets weekly for the purpose of community building, orientation to the campus and the Education major, and academic support. The long term goal of this seminar is to not only set the foundation for the major, but to build a learning community experience that follows students over the course of their program at UCR. New, incoming transfer students are given enrollment priority into this course which carries 2 units of academic credit. These units are not applied toward major requirements. The seminar is recommended, but not required for completion of the degree. The seminars are graded on an "S/NC" basis.

Transfer Students

Admission is selective and based on all transferable coursework with a minimum GPA of 2.4 (2.8 for non-residents). There is no prerequisite "Major" coursework required. Meeting the minimum eligibility requirements does not guarantee admission.

University Requirements

See Undergraduate Studies section.

College Requirements

See the School of Education section.

Major Requirements

The major requirements for the B.A. degree in Education, Society, and Human Development, with concentrations in Education for Social Justice and Learning and Behavioral Studies.

Change of Major

Students switching to the Education, Society, and Human Development Major must be in good academic standing at time of major change and have completed at least one Education course with a grade of "C" of better, excluding EDUC 102 and EDUC 190-198.

Education for Social Justice Concentration

1. **Lower-division requirements (5 courses [at least 20 units])**
   - (a) EDUC 005
   - (b) EDUC 010 or EDUC 010H
   - (c) At least 3 of the following lower-division courses (at least 12 units):

     EDUC 001, EDUC 002, EDUC 019 (E-Z), EDUC 023, EDUC 024, EDUC 032A, EDUC 032B, EDUC 032C, EDUC 041, EDUC 042, EDUC 043, EDUC 050, EDUC 051, EDUC 052, EDUC 061
2. **Upper-division requirements (7 courses [at least 28 units])**
   - (a) Educational Research Methods (1 course [at least 4 units])
     - (1) EDUC 118
   - (b) Concentration courses (4 courses [at least 16 units])
     - (1) EDUC 103W, EDUC 122, EDUC 123, EDUC 141, EDUC 142, EDUC 144, EDUC 145/BLKS 145, EDUC 146/ETST 146, EDUC 147, EDUC 148, EDUC 149, EDUC 150, EDUC 151, EDUC 152, EDUC 153, EDUC 154, EDUC 155
   - (c) Elective courses (2 courses [at least 8 units]
     - (1) EDUC 111 (E-Z), EDUC 119 (E-Z), EDUC 132, EDUC 134, EDUC 160, EDUC 161, EDUC 162, EDUC 171 or EDUC 172, EDUC 179A, EDUC 181, EDUC 182, EDUC 183, EDUC 184, EDUC 190

     A maximum of 8 units of EDUC 190 may be taken to satisfy elective degree requirements.
3. **Community Engaged Learning (40 hours minimum)**
   - (a) A minimum of 40 hours of field experiences, research, internship, and/or service-learning (activity) in an approved education setting.
     - (1) For a list of field experiences, research, internship, and/or service-learning opportunities and how to demonstrate completion of the minimum 40 hours, please consult with the Community Engaged Learning Coordinator or an academic advisor in the Undergraduate Programs Office in the School of Education and/or the Undergraduate programs Community Engaged Learning section of School of Education's website.

Learning and Behavioral Studies Concentration

1. **Lower-division requirements (5 courses [at least 20 units])**
   - (a) EDUC 005
   - (b) EDUC 010 or EDUC 010H
   - (c) At least 3 of the following lower-division courses (at least 12 units):

     EDUC 001, EDUC 002, EDUC 019 (E-Z), EDUC 023, EDUC 024, EDUC 032A, EDUC 032B, EDUC 032C, EDUC 041, EDUC 042, EDUC 043, EDUC 050, EDUC 051, EDUC 052, EDUC 061
2. **Upper-division requirements (7 courses [at least 28 units])**
   - (a) Education Research Methods (1 course [at least 4 units])
     - (1) EDUC 118
   - (b) Concentration courses (4 courses [at least 16 units])
     - (1) EDUC 132, EDUC 134, EDUC 160, EDUC 161, EDUC 162, EDUC 179A, EDUC 181, EDUC 182, EDUC 183, EDUC 184
   - (c) Elective courses (2 courses [at least 8 units])
     - (1) EDUC 103W, EDUC 104, EDUC 105, EDUC 111 (E-Z), EDUC 119 (E-Z), EDUC 122, EDUC 123, EDUC 141, EDUC 142, EDUC 144, EDUC 145/BLKS 145, EDUC 146/ETST 146, EDUC 147, EDUC 148, EDUC 149, EDUC 150, EDUC 151, EDUC 152, EDUC 153, EDUC 154, EDUC 155, EDUC 171 or EDUC 172, EDUC 190

     A maximum of 8 units of EDUC 190 may be taken to satisfy elective degree requirements.
3. **Community Engaged Learning (40 hours minimum)**
   - (a) A minimum of 40 hours of field experiences, research, and/or service-learning (activity) in an education setting.
     - (1) For a list of field experiences, research, internship, and/or service-learning opportunities and how to demonstrate completion of the minimum 40 hours, please consult with the Community Engaged Learning Coordinator or an academic advisor in the Undergraduate Programs Office in the School of Education and/or the Undergraduate programs Community Engaged Learning section of School of Education's website.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Athletic Leadership Minor

1207 Sproul Hall
(951) 827-4633
education.ucr.edu

Committee in Charge

Eddie Comeaux, Professor of Higher Education (Education)
Uma Jayakumar, Associate Professor of Higher Education (Education)
Rita Kohli, Professor of Education, Society, and Culture (Education)
Austin H. Johnson, Associate Dean of Undergraduate Education in SOE (Education)
Rican Vue, Assistant Professor of Higher Education (Education)
Joi A. Spencer, Dean, ex officio

The Athletic Leadership Minor is to prepare students for leadership careers in athletics, particularly at the intercollegiate level. It is designed to provide students with a solid understanding of the administration of student affairs and athlete development. Students will advance their understanding of the role athletics leaders' play in the larger university and college systems environments.

Program Requirements

Student petitions require the approval of the Undergraduate Education Programs advisor in the School of Education. College approval from both the School of Education and the major college is required. Please see education.ucr.edu for the minor petition process. Athletic Leadership Minor candidates must maintain a minimum cumulative GPA of 2.0.

Requirements for the minor (20 units):

1. Lower-division requirements (4 units): EDUC 050
2. Upper-division requirements (four courses [at least 16 units]): EDUC 147, EDUC 150, EDUC 152, EDUC 154, EDUC 190, EDUC 198G or EDUC 198I

   A maximum of 4 units of EDUC 190 may be taken to satisfy elective requirements. A maximum of 4 units of EDUC 198G or EDUC 198I may be taken to satisfy elective requirements. The EDUC 190, EDUC 198G, or EDUC 198I course must be approved by the associate dean or chair of minor program to apply to degree requirements to ensure the experience aligns with program outcomes.

See Minors under the School of Education in the Colleges and Programs section of this catalog for additional information on minors.

Education Minor

The Education minor offers to any undergraduate student an introduction to issues and practices of education and research in public schools. Students from any major are invited to pursue a minor in Education.

Students in the Education minor may select from a variety of courses that may focus on a particular interest or may sample across aspects of the curriculum. Specific areas of interest that are reflected in the course offerings include: Special education, psychology, higher education, policy and leadership, culture and language, issues of classism, racism, sexism, heterosexism, diversity and equity, social justice, curriculum and teaching strategies, qualitative and quantitative methods, and educational research.

The School of Education has a list of Education minor themes consisting of topic areas with a list of courses. The themes have been created to help students explore a focused subject area in Education by way of the Education minor. Students can visit the Undergraduate Education section on SOE's website at education.ucr.edu to view the list of Education minor themes and suggested coursework. Students may also consult with the Program Advisor on the themes and which option(s) to pursue.

The Education minor does not lead to a teaching credential; however, some of the courses will satisfy UCR Teacher Education Program requirements. Students who are interested in pursuing a teaching credential should contact the Teacher Education Program at (951) 827-5225.

Program Requirements

The Education minor consists of the satisfactory completion of at least 24 units in courses identified for the Education Minor Program. At least 16 units must be completed in upper division courses.

Student petitions require the approval of the program advisor in the Education minor. Students may not petition to take more than 8 units of courses outside of the identified courses for the Education minor. College approval from both the School of Education and the major college is required.

Please see education.ucr.edu for the minor petition process. Minor in Education candidates must maintain a minimum cumulative GPA of 2.0.

Course Work

Students will have the opportunity to select from a menu of electives to complete the course work:

EDUC 001, EDUC 002, EDUC 003, EDUC 004, EDUC 005, EDUC 010 or EDUC 010H, EDUC 019 (E-Z), EDUC 023, EDUC 024, EDUC 032A, EDUC 032B, EDUC 032C, EDUC 041, EDUC 042, EDUC 043, EDUC 044, EDUC 050, EDUC 051, EDUC 052, EDUC 061, EDUC 103W, EDUC 104, EDUC 105, EDUC 111 (E-Z), EDUC 118, EDUC 119 (E-Z), EDUC 122, EDUC 123, EDUC 132, EDUC 134, EDUC 136, EDUC 141, EDUC 142, EDUC 144, EDUC 145/BLKS 145, EDUC 146/ETST 146, EDUC 147, EDUC 148, EDUC 149, EDUC 150, EDUC 151, EDUC 152, EDUC 153, EDUC 154, EDUC 155, EDUC 160, EDUC 161, EDUC 162, EDUC 171 or EDUC 172, EDUC 177 or EDUC 178, EDUC 179A, EDUC 179B, EDUC 181, EDUC 182, EDUC 183, EDUC 184

Additional courses may be added to this list by proposals of academic units, or by petitions of students to take a suitable alternative course.

Graduate Programs

The School of Education offers three degree programs–Doctor of Philosophy, Master of Arts and Master of Education–as well as a variety of teacher credential programs. Each of these programs is described in detail below.

General university requirements, such as residence and unit requirements, are in the Graduate Studies section of this catalog. Policies and Procedures for Graduate Degree Programs may be obtained from the Graduate Programs Office.

Admission

Admission is based upon many factors, including but not limited to GPA, interview, statement of purpose, personal history, resume/curriculum vitae, match with program/faculty, non-academic achievements, personal qualities, diversity of personal background and experience, academic history, writing sample, personal background, career objectives, and letters of recommendation from writers knowledgeable about the candidate's ability to succeed in graduate study.

Admission for the doctoral degree is based on strong academic preparation at the baccalaureate level. A master's degree in education such as that offered at UCR or a master's degree in an ancillary field is desirable but not required. Doctoral students begin their programs in the fall quarter.

Detailed admission information is available at education.ucr.edu.

Master of Arts

Candidates enrolled in this program normally have completed an undergraduate major or its equivalent in a subject field other than education.

Concentration

Areas of concentration include Education, Society, and Culture; Educational Psychology; Neuroscience and Education; Research, Evaluation, Measurement and Statistics; Special Education and Autism; School Psychology (for students working toward the Ph.D.); and STEM Education and Equity. Only students matriculating in a School of Education Ph.D. program in School Psychology, may earn a M.A. degree in Education with concentration in School Psychology. Before the end of the first quarter, the student's advisor develops a program plan that specifies the courses the student will take.

The M.A. with concentration in Education, Society, and Culture; Educational Psychology; Special Education and Autism; or STEM Education and Equity gives students the option of completing Plan I (Thesis) or Plan II (Comprehensive Examination).

The M.A. with concentration in School Psychology or Neuroscience and Education only allows students to complete the Plan I (Thesis option). The M.A. concentration in Research, Evaluation, Measurement and Statistics only allows students to take Plan II (comprehensive examination option).

Information about each area of concentration is available at education.ucr.edu.

Plan I (Thesis)
Students complete a minimum of 36 upper-division and graduate units. At least 24 of these units are in graduate courses.

A maximum of 12 units may be in graduate research for the thesis.

At the beginning of the second, and generally not later than the third quarter of full-time work, candidates submit a plan for the thesis to their committee. Candidates also list courses to be taken for developing competence in their area of specialization. The plan is reviewed and approved by a committee of three faculty members. The candidate submits the final thesis to the committee for approval. Upon successful completion and approval of the thesis, the student is recommended to the Graduate Division for the M.A. degree.

Plan II (Comprehensive Examination)
Students must complete a minimum of 36 quarter units in upper-division and graduate courses in Education and related fields as defined in existing programs. At least 18 of the 36 units must be in graduate courses, and none in graduate research for the thesis.

A faculty member from the program area concentration is appointed by the graduate advisor to guide the candidate. A program plan must be filed with the graduate advisor by the end of the first quarter of residency. Upon or near completion of course work, the student applies to take a comprehensive written examination. Upon successful completion of the examination, the candidate is recommended to the Graduate Division for the M.A. degree.

Coursework
Candidates entering the M.A. program take a series of courses based on their area of concentration.

Education, Society, and Culture

Required Courses: Students take at least five courses (20 units) from: EDUC 201B, EDUC 203 or EDUC 281, EDUC 210, EDUC 221A, EDUC 221B, EDUC 226, EDUC 233, EDUC 238, EDUC 245E, EDUC 245G, EDUC 248E, EDUC 248I, EDUC 248P or EDUC 248U, EDUC 257, EDUC 260, EDUC 269I, EDUC 273, EDUC 275A, EDUC 276, EDUC 278, EDUC 279, EDUC 284

Professional Development requirement: EDUC 259

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

Educational Psychology

Required Courses: EDUC 200, EDUC 211A, EDUC 214A, EDUC 214B, EDUC 214C, EDUC 221A, EDUC 240, EDUC 255B

Professional Development requirement: EDUC 259

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

Neuroscience and Education

Required Courses: EDUC 211A, EDUC 214A, EDUC 214B, EDUC 214C, EDUC 240, EDUC 246T, PSYC 251

Elective Courses - three (3) or more courses: EDUC 211B, EDUC 246I, EDUC 246K, EDUC 263, EDUC 267, EDUC 269E, EDUC 269P, EDUC 269S, EDUC 270, NRSC 200A, NRSC 200B, NRSC 200C, PSYC 203A, PSYC 203B, PSYC 203C, PSYC 207A, PSYC 207B, PSYC 211, PSYC 212, PSYC 213, PSYC 214, PSYC 262, PSYC/NRSC 287, NRSC 289

Professional Development requirement: EDUC 259

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

Research, Evaluation, Measurement, and Statistics (REMS)

Required Methodology Courses: EDUC 214A, EDUC 214B, EDUC 214C, EDUC 218, EDUC 221A, EDUC 221B

Elective Methodology
A minimum of one course from the following list of quantitative courses or from courses offered in other departments that are approved by the student's program committee: EDUC 211A, EDUC 211B, EDUC 215, EDUC 216A, EDUC 216B, EDUC 216C, EDUC 217

Internship
Minimum of 5 units of EDUC 298I required.

Professional Development requirement: EDUC 298I

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

School Psychology

Required Methodology Courses: EDUC 214A, EDUC 214B, EDUC 214C

Psychological Consultation, Assessment, and Intervention
Required courses: EDUC 254A, EDUC 254B, EDUC 255B

Application of Scientific Psychology
Required courses: EDUC 265A, EDUC 265B, EDUC 265C

History and Systems of Psychology and Basic Content Areas in Scientific Psychology
Required courses: EDUC 239, EDUC 246S, EDUC 250, EDUC 252, EDUC 264

Professional Development requirement: EDUC 259

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

Special Education and Autism

Required Course
EDUC 214A

Elective Courses
Students must complete one of the following courses: EDUC 200, EDUC 246J, EDUC 246M

Additional Elective Course Options
students take at least one course from the following group according to their individualized program: EDUC 215, EDUC 239, EDUC 246 (E-Z), EDUC 267, EDUC 270

Area elective course options
Students must take at least one course from Area I and Area II:

Area I - Autism Spectrum Disorder and other Cognitive, Behavioral, and Emotional Disabilities: EDUC 239, EDUC 246E, EDUC 246K, EDUC 246L, EDUC 255A, EDUC 255C

Area II - Learning Disabilities: EDUC 211A, EDUC 246I, EDUC 246S, EDUC 255A, EDUC 255B, EDUC 256, EDUC 270

Professional Development requirement: EDUC 259

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

STEM Education and Equity

Tier 1 – Required Courses: EDUC 214A or EDUC 221A, EDUC 230E, EDUC 230L, EDUC 230R

Tier II – Elective Courses – Students must complete a minimum of 4 courses of electives from at least 2 categories:

Category 1 – Critical Race Theory: EDUC 248E or EDUC 248W, EDUC 273 or EDUC 278 or EDUC 284

Category 2 – Teaching and Learning: EDUC 230G, EDUC 230M, EDUC 269E

Category 3 – Leadership: EDUC 245G, EDUC 245L, EDUC 267, EDUC 269I

Tier III – Thesis or Comprehensive Examination Preparation Complete a minimum of 4 units based on the following options:

Thesis Preparation: EDUC 299

Comprehensive Examination: Course(s) will be chosen from Tier II, depending on program goals. EDUC 299 cannot be used.

Tier IV - Professional Development requirement: EDUC 259

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

Normative Time to Degree
6 quarters from admission to the M.A. program

Master of Education

A Master of Education (M.Ed.) degree program is offered that allows students to select from six concentrations. The GRE is not required for admission to the M.Ed. program. No thesis or comprehensive examination is required. Instead, students complete an analytical project that builds on course work and links educational theory and research with the dynamics of teaching, learning, and leadership.

Education Policy Analysis and Leadership Concentration

This M.Ed. concentration prepares students for work examining school and campus reform and policy at the local, state, and national levels.

Students may have the opportunity to complete an internship of up to 4 units in consultation

with their faculty advisor. The internship is an optional component and not required for degree completion.

The concentration can also be completed through a collaboration between the School of Education and the University Extension by completing an approved Extension certificate program that addresses issues of educational policy and leadership. Up to 9 units of 400 level Extension certificate courses can be used toward the minimum 36-unit total required for the degree. The student must have completed the approved Extension certificate prior to admission to this program. Please see the School of Education website at **education.ucr.edu** for an approved list of Extension certificate(s) that can be used for the collaboration.

Admission
Candidates for this program must meet the School of Education admission requirements. Detailed admission information is available at **education.ucr.edu**.

Course Work
This M.Ed. concentration requires a minimum of 36 units.

Foundational Courses – Students complete at least three (3) of the following courses for a minimum of 12 units from: EDUC 202A or EDUC 202B, EDUC 209, EDUC 210, EDUC 245G, EDUC 245L

Research Methods – Student must complete two courses, for a minimum of eight (8) units:

Part 1: EDUC 214A

Part 2: EDUC 221A or EDUC 221B

Elective Courses – Students complete at least three (3) courses for a minimum of 12 units, in consultation with faculty advisor, from: EDUC 202A or EDUC 202B, EDUC 203 or EDUC 281, EDUC 210, EDUC 225, EDUC 226, EDUC 233, EDUC 238, EDUC 245G, EDUC 245L, EDUC 248G, EDUC 248J, EDUC 248N, EDUC 248O, EDUC 257, EDUC 260, EDUC 266, EDUC 269M, EDUC 275A, EDUC 276, EDUC 278, EDUC 279, EDUC 284, EDUC 298I*

*Maximum of 4-units of EDUC 298I.

Directed Research – Students must complete at least four (4) units of EDUC 297 directed research with their faculty advisor in the final term of their coursework.

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

Analytical Report
Students will be required to complete a culminating policy report. The report will either be organized as a literature review or as a policy analysis. The project is expected to take at least two regular academic terms to complete and may well include one or more of the following: research, service learning, or program internship opportunities, tied to an in-depth investigation of the topic of study. The goal of the project is to enable the student to explore work in an area in significant depth and to help prepare that student for the work they wish to do upon graduation. A final version of the project will be submitted to the School of Education and evaluated by faculty in the Education Policy Analysis and Leadership area.

General Education Teaching Concentration

M.Ed. and California Preliminary Teaching Credential in Multiple Subjects or Single Subject

This concentration allows qualified students to complete requirements for a California Preliminary teaching credential and a master's degree in one academic year and one summer. The program goes beyond best practice by preparing students to critically evaluate the literature on current and future practices in the field of education.

Prospective students must submit an application to the Graduate Division.

Concurrent admission into the California Preliminary Multiple Subject or Single Subject Teaching Credential program is required for this emphasis. Students not admitted to the M.Ed. degree can be considered for a credential only program. Those who already possess California teaching credentials are not eligible for this program but may apply for admission to the other graduate degree programs offered by the SOE.

Admission
In addition to the Graduate Division admission requirements, candidates for this program must be admitted to one of the following programs: California Preliminary Multiple Subject or California Preliminary Single Subject Teaching Credential

Please see the Teacher Education section of the School of Education's website at **education.ucr.edu** to learn about the requirements, in addition to the coursework, listed that must be completed to earn any of the credentials with the California Commission on Teacher Credentialing. Candidates are subject to any changes the state may impose until fully credentialed.

Course Work
This M.Ed. concentration requires up to 74 units, 36 units are in upper division and graduate level courses; SOE requires at least 28 of the 36 units must be completed in graduate level courses (Plan II). Students must successfully complete their credential requirements to earn the degree. This program requires courses taken during summer sessions.

M.Ed. General Education Teaching Concentration and California Preliminary Multiple Subject Teaching Credential

1. The following courses are required for the teaching credential: EDUC 132*, EDUC 147*, EDUC 171* or EDUC 172*, EDUC 179A*

   *This course can be waived if completed as part of an undergraduate program and approved by the Graduate Advisor.
2. Up to 8 units can be applied to the master's degree if the courses were not applied to a previous degree: EDUC 132, EDUC 147, EDUC 171 or EDUC 172, EDUC 179A
3. The following courses are required for teaching credential and the master's degree: EDUC 280L, EDUC 282A, EDUC 282B
4. Minimum of three elective courses from the following list: EDUC 201B, EDUC 202B, EDUC 209, EDUC 211B, EDUC 219, EDUC 225, EDUC 226, EDUC 227, EDUC 233, EDUC 238, EDUC 240, EDUC 245G, EDUC 245K, EDUC 246 (E-Z), EDUC 255B, EDUC 257, EDUC 260, EDUC 266, EDUC 269 (E-Z), EDUC 273, EDUC 275B, EDUC 280M, EDUC 280R, EDUC 281, EDUC 286
5. Analytical Project Course: EDUC 283
6. Seminar Courses: EDUC 330 or EDUC 332 or EDUC 334, EDUC 344A, EDUC 344B, EDUC 344C
7. Supervised Teaching Experience Courses: EDUC 336A or EDUC 338A*, EDUC 336B or EDUC 338B*, EDUC 336C or EDUC 338C*

   * Only approved intern teachers can enroll in EDUC 338 sections. Information on intern teacher eligibility requirements, visit: **education.ucr.edu**.
8. Teaching Performance Courses: EDUC 337A, EDUC 337B, EDUC 337C

   EDUC 179B or EDUC 286 is available for students who have an interest in the Bilingual Authorization. Students should contact their academic advisor to discuss the Bilingual Authorization.

   Other courses may be used to complete degree requirements, if approved by the Graduate Advisor.

M.Ed. General Education Teaching Concentration and California Preliminary Single Subject Teaching Credential

1. The following courses are required for teaching credential: EDUC 132*, EDUC 147*, EDUC 177* or EDUC 178*, EDUC 179A*

   *This course can be waived if completed as part of an undergraduate program and approved by the Graduate Advisor.
2. Up to 8 units can be applied to the master's degree if the courses were not applied to a previous degree: EDUC 132, EDUC 147, EDUC 177 or EDUC 178, EDUC 179A
3. The following courses are required for teaching credential and the master's degree:

   a. EDUC 280L

   b. One from EDUC 285 (E-Z)

   c. Minimum of four elective courses from the following list: EDUC 201B, EDUC 202B, EDUC 209, EDUC 211B, EDUC 219, EDUC 225, EDUC 226, EDUC 227, EDUC 233, EDUC 238, EDUC 240, EDUC 245G, EDUC 245K, EDUC 246 (E-Z), EDUC 255B, EDUC 257, EDUC 260, EDUC 266, EDUC 269 (E-Z), EDUC 273, EDUC 275B, EDUC 280M, EDUC 280R, EDUC 281, EDUC 286 Analytical Project Course: EDUC 283
4. Seminar Courses: EDUC 333 or EDUC 334, EDUC 348A, EDUC 348B, EDUC 348C
5. Supervised Teaching Experience Courses: EDUC 376A or EDUC 378A*, EDUC 376B or EDUC 378B*, EDUC 376C or EDUC 378C*

   * Only approved intern teachers can enroll in EDUC 378 sections. Information on intern teacher eligibility requirements, visit: **education.ucr.edu**.
6. Teaching Performance Courses: EDUC 377A, EDUC 377B, EDUC 377C
   EDUC 179B or EDUC 286 is available for stuents who have an interest in the

Bilingual Authorization. Students should contact their academic advisor to discuss the Bilingual Authorization.

Other courses may be used to complete degree requirements, if approved by the Graduate Advisor.

Analytical Project
The analytical project centers on comprehensive, critical self-analyses of instructional practice in K-12 classrooms.

A final version of the analytical project is submitted to the School of Education in electronic form for faculty committee review.

Higher Education Administration and Policy Concentration

This M.Ed. concentration examines scholarship and research on institutions, policy, systems, and demographic, historical, political, social, and economic contexts. It emphasizes reflective practice and prepares practitioners for careers in higher education institutions so that they can be knowledgeable scholars and expert professionals.

Admission
Candidates for this program must meet the Graduate Division and School of Education admission requirements. Detailed admission information is available at education.ucr.edu

Course Work
36 units are required. The majority of courses are offered in the School of Education (SOE) and focus on higher education, but program plans may substitute up to 12 units of relevant graduate level courses offered in SOE and other departments.

Required Course: EDUC 248T (4 units)

Elective Courses: Students take at least eight courses (32 units) from: EDUC 248E, EDUC 248F, EDUC 248G, EDUC 248I, EDUC 248J, EDUC 248L, EDUC 248M, EDUC 248N, EDUC 248O, EDUC 248P, EDUC 248Q, EDUC 248R, EDUC 248S, EDUC 248U, EDUC 248V, EDUC 248W, EDUC 269N

Analytical Report
After students complete their course work they will complete a case study report that integrates content from higher education courses with practice.

A final version of the report is submitted to the Higher Education faculty committee in the School of Education for review and approval.

Race and Educational Justice Concentration

This M.Ed. concentration is designed for individuals who are interested in developing a critical lens to identify, discuss, and address racial issues and their intersection with other structures of power across the K-20 pipeline and in community-based educational contexts. Educational justice requires people and structures to identify and act to disrupt racism embedded in systems and structures. The concentration provides students with rigorous theoretical and applied frameworks to support movements of change using social, historical, racial, cultural, linguistic, gendered, and institutional factors impeding racial justice within educational spaces, as well as approaches to creating more racially just and culturally sustaining education environments for all students.

The program can also be completed through a collaboration between the School of Education and University Extension by completing an approved Extension certificate program that addresses issues of racial justice. Up to 9 units of 400 level Extension certificate courses can be used toward the minimum 36 unit total required for the degree. The student must have completed the approved Extension certificate prior to admission to this program. Please see the School of Education website at education.ucr.edu for an approved list of Extension certificates that can be used for the collaboration and this specific degree emphasis.

Admission
Candidates for this program must meet the Graduate Division and School of Education admission requirements. Detailed admission information is available at education.ucr.edu.

Course Work
This M.Ed. concentration requires a minimum of 36 units; Students will be expected to complete the course work in three academic quarters.

Students complete coursework from the following menu: EDUC 201B, EDUC 210, EDUC 220A, EDUC 220B, EDUC 225, EDUC 226, EDUC 238, EDUC 245G, EDUC 245L, EDUC 248E, EDUC 248I, EDUC 248P or EDUC 248U, EDUC 248W, EDUC 257, EDUC 269I, EDUC 273, EDUC 275A or EDUC 275B, EDUC 277, EDUC 278, EDUC 281, EDUC 284, EDUC 297

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

Analytical Report
Students will complete a final written project that addresses a specific concern or issue regarding race and racism in PK-20+ education. A final version of the project will be submitted to the School of Education and evaluated by faculty in the Education, Society, and Culture area.

Special Education Teaching Concentration

M.Ed. and California Preliminary Education Specialist Credentials
This degree concentration is designed to provide a pathway to complete requirements for the dual California Preliminary Education Specialist Credentials of Mild/Moderate Support Needs and Extensive Support Needs Credentials and Master of Education degree, Special Education Teaching Emphasis. The program goes beyond best practice by preparing students to critically evaluate the literature on current and future practices in education.

Prospective students must submit an application to the Graduate Division.

Admission is required into the dual California Preliminary Education Specialist Credentials of Mild/Moderate Support Needs and Extensive Support Needs Credentials. Students not admitted to the M.Ed. degree emphasis can be considered for a credential only program. Those who already possess the dual California Preliminary Education Specialist Credentials of Mild/Moderate Support Needs and Extensive Support Needs Credentials are not eligible for this program, but may apply for admission to the other graduate degree programs offered by the SOE.

Admission
In addition to the Graduate Division admission requirement, candidates for this program must be admitted to the dual California Preliminary Education Specialist Credentials of Mild/Moderate Support Needs and Extensive Support Needs Credentials.

Please see the Teacher Education section of the School of Education's website at education.ucr.edu to learn about the requirements, in addition to the coursework, listed that must be completed to earn any of the credentials with the California Commission on Teacher Credentialing. Candidates are subject to any changes the state may impose until fully credentialed.

Course Work
The M.Ed. concentration requires up to 83 units, 36 units are in upper division and graduate level courses; SOE requires at least 28 of the 36 units must be completed in graduate level courses (Plan II). Students must successfully complete their credential requirements to earn the degree. This program requires courses taken during summer sessions.

M.Ed. Special Education Teaching and California Preliminary Education Specialist Credentials

California Preliminary Education Specialist - Mild/Moderate Support Needs and Extensive Support Needs Credentials:

1. The following courses are required for the teaching credential: EDUC 132*, EDUC 136*, EDUC 147*, EDUC 171* or EDUC 172*, EDUC 179A*

   *This course can be waived if completed as part of an undergraduate program and approved by the Graduate Advisor.

2. Up to 8 units can be applied to the master's degree if the courses were not applied to a previous degree: EDUC 132, EDUC 136, EDUC 147, EDUC 171 or EDUC 172, EDUC 179A
3. The following courses are required for the teaching credential and the master's degree: EDUC 280L, EDUC 282A, EDUC 282B, EDUC 287A, EDUC 287B
4. Minimum of three (3) elective courses:
   a. One (1) course from: EDUC 246 (E-Z)
   b. Minimum of two (2) courses from: EDUC 201B, EDUC 202B, EDUC 209, EDUC 211B, EDUC 219, EDUC 225, EDUC 226, EDUC 227, EDUC 233, EDUC 238, EDUC 240, EDUC 245G, EDUC 245K, EDUC 246 (E-Z), EDUC 255B, EDUC 257, EDUC 260, EDUC 266, EDUC 269 (E-Z), EDUC 273, EDUC 275B, EDUC 280M, EDUC 280R, EDUC 281, EDUC 286
5. Seminar Courses: EDUC 331 or EDUC 334, EDUC 381A, EDUC 381B, EDUC 381C

6. Supervised Teaching Experience Courses: EDUC 380A, EDUC 380B, EDUC 380C
7. Teaching Performance Courses: EDUC 382A, EDUC 382B, EDUC 382C
8. Analytical Project

Other courses may be used to complete degree requirements, if approved by the Graduate Advisor.

Analytical Project
Students will complete a final written project that integrates the content of theory and teaching methods courses. A final version of the report will be submitted to the School of Education and evaluated by faculty in the Special Education area.

STEM Education and Equity Concentration

This M.Ed. concentration is designed for educators, leaders, and researchers who are interested in reshaping educational experiences and opportunities via Science, Technology, Engineering, and Mathematics (STEM) access and equity. Those who pursue the STEM Education and Equity concentration should be interested in broadening participation, increasing access, and improving outcomes of minoritized students in STEM fields. This concentration will provide its students with the theoretical and practical knowledge, skills, and dispositions to become expert researchers, educators, and thought leaders who will advance educational theory, justice, research, and practice aimed at promoting equity in STEM education.

Admission
Candidates for this program must meet Graduate Division and School of Education admission requirements. Detailed admission information is available at education.ucr.edu.

Course Work
This M.Ed. specialization requires a minimum of 36 units.

Tier 1 – Required Courses: EDUC 214A or EDUC 221A, EDUC 230E, EDUC 230L, EDUC 230R

Tier II – Elective Courses – Students must complete a minimum of 16 units (or 4 courses) of electives from at least 2 categories:

Category 1 – Critical Race Theory: EDUC 248E or EDUC 248W, EDUC 273 or EDUC 278 or EDUC 284

Category 2 – Teaching and Learning: EDUC 230G, EDUC 230M, EDUC 269E

Category 3 – Leadership: EDUC 245G, EDUC 245L, EDUC 267, EDUC 269I

Tier III – Analytical Project: EDUC 297

Students must complete at least four (4) units of EDUC 297 directed research with their faculty advisor in the final term of their coursework.

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

Analytical Project
Students will be required to complete a culminating written project that addresses a specific concern or issue regarding equity in STEM PK-20+ education. The project will aim to reshape educational experiences and opportunities in STEM. A final version of the project will be submitted to the School of Education and evaluated by program faculty (depending on project topic and themes).

Doctoral Degree

The doctoral program in Education is designed to prepare scholars for teaching and research in the area of education. More information about graduate programs in Education is available by contacting the graduate advisor, School of Education, (951) 827-6362, or visit education.ucr.edu.

Concentration
The School of Education has six areas of concentration: Education, Society, and Culture; Education Policy Analysis and Leadership; Educational Psychology; Higher Education Administration and Policy; School Psychology; and Special Education. The School Psychology Program is accredited by the American Psychological Association (APA) and approved by the National Association of School Psychologists (NASP). School Psychology Ph.D. students can also obtain a Pupil Personnel Services Credential.

Information about each area of concentration is available at education.ucr.edu.

Following admission to the program, students are assigned a preliminary faculty advisor who guides them during the initial phase of their program. Students work closely with a faculty advisor during their doctoral program. In addition, three faculty committees — a program guidance committee, an oral qualifying examination committee, and a dissertation committee — may be formed at various stages of the program.

Course Work
Candidates entering the Ph.D. program take a series of courses based on their area of concentration. Number of units vary by concentration. The student and their program guidance committee identify and document a program plan. Coursework in each concentration consists of sufficient study to allow the student to master the essential concepts and inquiry methods of that field.

Education, Society, and Culture

Required core and methods courses: EDUC 214A, EDUC 223A, EDUC 223B, EDUC 241B

Theory - complete a minimum of two (2) courses from: EDUC 220A, EDUC 220B, EDUC 273, EDUC 277, EDUC 278, EDUC 284

Electives - complete a minimum of five (5) courses from the following list:
EDUC 201B, EDUC 203, EDUC 210, EDUC 226, EDUC 233, EDUC 238, EDUC 245E, EDUC 245G, EDUC 248E, EDUC 248I, EDUC 248P or EDUC 248U, EDUC 257, EDUC 260, EDUC 266, EDUC 269I, EDUC 275A, EDUC 276, EDUC 277, EDUC 279, EDUC 284

Teaching Requirement: EDUC 302

Professional Development requirement: EDUC 259

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

Education Policy Analysis and Leadership

Required Courses
Core Foundation: EDUC 209, EDUC 210

Core Methodology: EDUC 214A, EDUC 221A

Research Methodology
A student selects the Quantitative Methods or the Qualitative Methods strand:

Quantitative Methods Strand
Two (2) courses: EDUC 214B, EDUC 214C

Qualitative Methods Strand
Two (2) courses: EDUC 221B, EDUC 221C

Special Policy Topics - minimum of sixteen (16) units or four (4) courses from:
EDUC 202A, EDUC 205, EDUC 218, EDUC 245G, EDUC 245J, EDUC 245L, EDUC 269M

Social Science and Methods Electives: Minimum of eight (8) units or two (2) courses in Economics, Sociology, Social Psychology, Political Science, History, or other social science. Students may also substitute in one advanced research methods course. The courses must be approved by student's advisory committee.

Teaching Requirement: EDUC 302

Professional Development requirement: EDUC 259

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

Educational Psychology

This specialization offers two tracks. Track 1 is Cognition, Instruction, and Student Learning; Track 2 is Quantitative Methods. Students choose one track in consultation with faculty advisor.

Required Courses: EDUC 211A, EDUC 214A, EDUC 214B, EDUC 214C, EDUC 240, EDUC 215, EDUC 221A, EDUC 240, EDUC 255B,

Students choose Track 1 or Track 2 and take a minimum of two courses from that Track in consultation with faculty advisor:

Track 1 -Cognition, Instruction, and Student Learning: EDUC 200, EDUC 251, EDUC 256, EDUC 269E

Track 2 - Quantitative Methods: EDUC 216A, EDUC 216B, EDUC 216C, EDUC 218, EDUC 269E

Directed Research: EDUC 297 – A student will engage in predissertation research with at least one faculty member. Directed research lasts three quarters, minimum of four units each quarter, resulting in a research article submitted for presentation or publication.

Teaching Requirement: EDUC 302

Professional Development requirement: EDUC 259

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and

approval by the Graduate Advisor.

Higher Education Administration and Policy

Research Methodology
In consultation with the faculty advisor, a student selects the Quantitative or the Qualitative Methods Strand to complete, plus one course from the strand they did not select.

Quantitative Methods Strand - three (3) courses: EDUC 214A, EDUC 214B, EDUC 214C

and

One course from: EDUC 221A, EDUC 221B, EDUC 221C

or

Qualitative Methods Strand - three (3)

courses: EDUC 221A, EDUC 221B, EDUC 221C

and

One course from: EDUC 214A, EDUC 214B, EDUC 214C

Higher Education required core courses: EDUC 248F, EDUC 248I, EDUC 248J, EDUC 248K, EDUC 248N, EDUC 248O, EDUC 248U or EDUC 248P

Specialization and Elective Courses - two (2) or more courses: EDUC 248E, EDUC 248G, EDUC 248L, EDUC 248M, EDUC 248Q, EDUC 248R, EDUC 248S, EDUC 248V, EDUC 248W, EDUC 269N

Teaching Requirement: EDUC 302

Professional Development requirement: EDUC 259

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

School Psychology

Research Design and Methodology Courses
Required Courses: EDUC 214A, EDUC 214B, EDUC 214C, EDUC 215, EDUC 216A or EDUC 216B, EDUC 217, EDUC 299

Psychological Consultation and Intervention
Required courses: EDUC 255A, EDUC 255B, EDUC 255C, EDUC 255D, EDUC 261, EDUC 267

Psychological and Behavior Assessment Required courses: EDUC 252, EDUC 254A, EDUC 254B, EDUC 254C

Application of Scientific Psychology
Required courses: EDUC 265A, EDUC 265B, EDUC 265C, EDUC 265D, EDUC 265E, EDUC 265F, EDUC 268A, EDUC 268B, EDUC 268C

History and Systems of Psychology and Basic Content Areas in Scientific Psychology
Required courses: EDUC 211A, EDUC 239, EDUC 262, EDUC 246S, EDUC 246T, EDUC 250, EDUC 263, EDUC 264

Internship: Minimum of 12 units of EDUC 298I required. Students must complete and pass the oral qualifying examination before starting the required 1500-hour internship.

Teaching Requirement: EDUC 302

Professional Development requirement: EDUC 259

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

Special Education

Required Courses: EDUC 211A, EDUC 214A, EDUC 214B, EDUC 214C, EDUC 221A, EDUC 255B

Elective Courses - students must take at least one (1) course in each of the two elective areas:

Area I – Autism Spectrum Disorder and other Cognitive, Behavioral, Emotional Disabilities: EDUC 239, EDUC 246K, EDUC 246L, EDUC 246N, EDUC 254C, EDUC 255A

Area II – Learning Disabilities: EDUC 246I, EDUC 246S, EDUC 256

Specialization Courses: A student will take a minimum of three (3) additional graduate level courses from SOE or other academic departments in consultation with their faculty advisor.

Teaching Requirement: EDUC 302

Professional Development requirement: EDUC 259

Other courses may be used to complete degree and elective requirements, in consultation with the Faculty Advisor and approval by the Graduate Advisor.

Written Qualifying Examination
Near completion of the second year of study or after 60 units of graduate level course work, students take the written qualifying examination. The student's faculty advisor, in consultation with faculty associated with the student's area of specialization, coordinates the construction of the written examination. Students must

1. Review critical literature in an assigned field
2. Demonstrate competence in research methodologies, and
3. Demonstrate competence over content in fields of specialization.

The faculty associated with the student's area of specialization evaluate the written qualifying examination to determine the outcome. In the event students do not pass one or more sections, they will have one more opportunity to pass to continue in the program.

Pre-proposal and Oral Qualifying Exam
Following the successful completion of the written examination and before the oral qualifying examination, the Graduate Dean approves an oral qualifying committee nominated by the program. The committee consists of the student's faculty advisor, three additional faculty members from the School of Education, and one faculty member from outside the school. In preparation for the oral qualifying examination, students develop a pre-proposal, setting forth the direction of their dissertation. Once the faculty advisor determines that the pre-proposal is ready for the oral examination, it is distributed to the oral qualifying committee. The committee uses the pre-proposal as a focus for examining the student, but the questioning may go beyond the pre-proposal. Students pass the oral qualifying examination when the committee is satisfied that 1) the pre-proposal, as well as the student's grasp of the theoretical and empirical issues at its core, leads in a productive direction toward a competent dissertation, and 2) the student has demonstrated competence in areas covered by the written examination that are also addressed in the oral examination.

Mode options for the Oral Qualifying Exam are as follows:

- **In-person** – all committee members and student physically present on campus at UCR
- **Hybrid** – some committee members/ student in-person, some committee members/student remote (no limitations for total number of members online)
- **Remote** – all committee members and student attend remotely

The student and approved committee will decide which mode is appropriate for the exam. Additionally, the mode will be determined based on documented accommodations through Student Disability Resource Center or Human Resources/Academic Personnel. Only one mode is required to complete the exam. If in-person or hybrid mode is utilized, a staff member will be present to help setup Information Technology (IT) equipment the day of the exam or provide training to the student/ committee member in advance of the exam to operate IT equipment independently.

Proposal
Prior to commencing the dissertation research, students must have a dissertation pro roposal approved by the dissertation commmittee.

Dissertation
Following the approval of the dissertation proposal, students will complete a dissertation and schedule an oral defense with the approval of the committee chair. The dissertation must be approved by the dissertation committee and submitted to the Graduate Division before the candidate is recommended for the degree.

Mode options for the Dissertation Final Defense are as follows:

- **In-person** – all committee members and student physically present on campus at UCR
- **Hybrid** – some committee members/ student in-person, some committee members/student remote (no limitations for total number of members online)
- **Remote** – all committee members and student attend remotely

The student and approved committee will decide which mode is appropriate for the exam. Additionally, the mode will be determined based on documented accommodations through Student Disability Resource Center or Human Resources/Academic Personnel. Only one mode is required to complete the defense. If in-person or hybrid mode is utilized, a staff member will be present to help setup IT equipment the day of the defense or provide training to the student/committee member in advance of the defense to operate IT equipment independently.

Teaching Requirement
EDUC 302 is taken for a minimum of one

quarter. Units are determined by supervising course instructor.

Language Other than English Requirement None

Professional Development Requirement All students must enroll in EDUC 259.

Transfer Unit Policy
At least 20 units in-residence of 200-level graduate classes at UCR in addition to EDUC 259 and EDUC 302, excluding EDUC 290, 291, 297 and 299. Specific courses to be determined in conjuction with faculty advisor.

Normative Time to Degree 15 quarters from admission to the Ph.D. program

Credential Programs

The School of Education offers teaching credential programs, and a credential for school psychologists. These programs are accredited by the California Commission on Teacher Credentialing. Combined teacher credential programs with a Master of Education degree (M.Ed.) are described in the Master of Education section.

Admission

Admission to a credential program is based upon GPA and letters of recommendation from individuals knowledgeable about the candidate's ability to succeed in professional study. Most programs also require an interview. Admission also requires candidates to pass exams in basic skills and subject matter. Detailed admission information is available at education.ucr.edu.



Programs for the Preparation of Teachers

Post baccalaureate Teaching Credential Programs

The School of Education offers credential programs that result in teacher certification and do not require admission to a master degree program. The following programs are offered:

- California Preliminary Multiple Subject Teaching Credential
- California Preliminary Multiple Subject Teaching Credential Internship
- California Preliminary Single Subject Teaching Credential
- California Preliminary Single Subject Teaching Credential Internship
- California Preliminary Education Specialist - Mild/Moderate Support Needs and Extensive Support Needs Credentials

California Preliminary Multiple Subject Teaching Credential

This credential program allows students to complete the requirements for a California Preliminary Multiple Subject Teaching Credential in one academic year and one summer. The California Preliminary Multiple Subject Teaching Credential is for the elementary setting. A bilingual emphasis in Spanish is available to qualified candidates who want to be authorized to deliver instruction in Spanish as well as English. Students must successfully complete their credential requirements to earn the certification. This program requires courses that are taken during summer sessions.

Course Work

The California Preliminary Multiple Subject Teaching Credential requires at least 32 to 52 units. Students will complete at least 32 units and an additional 4 to 20 units are required if a student has not previously completed the courses noted below with an asterisk.

Required Courses:

EDUC 132*, EDUC 147*, EDUC 162*, EDUC 171* or EDUC 172*, EDUC 179A*, EDUC 282A, EDUC 282B, EDUC 332 or EDUC 334, EDUC 336A, EDUC 336B, EDUC 336C, EDUC 337A, EDUC 337B, EDUC 337C EDUC 344A, EDUC 344B, EDUC 344C

* This course can be recognized if completed as part of an undergraduate program and approved by the Graduate Advisor.

California Preliminary Multiple Subject Teaching Credential Internship

This credential program allows students to complete the requirements for a California Preliminary Multiple Subject Teaching Credential Internship in one academic year and one summer. The California Preliminary Multiple Subject Teaching Credential Internship is for the elementary setting. A bilingual emphasis in Spanish is available to qualified candidates who want to be authorized to deliver instruction in Spanish as well as English. This program requires courses taken during summer sessions.

Course Work

The California Preliminary Multiple Subject Teaching Credential Internship requires at least 46 units.

Required Courses:

EDUC 282A, EDUC 282B, EDUC 332 or EDUC 334, EDUC 337A, EDUC 337B, EDUC 337C, EDUC 338A, EDUC 338B, EDUC 338C EDUC 344A, EDUC 344B, EDUC 344C

The following courses are required for teaching certification and are taken prior to admission to this program: EDUC 132, EDUC 147, EDUC 162, EDUC 171 or EDUC 172, EDUC 179A

Please see the Teacher Education section of the School of Education's website at education.ucr.edu to learn about the requirements, in addition to the coursework, listed that must be completed to earn the credential with the California Commission on Teacher Credentialing.

California Preliminary Single Subject Teaching Credential

This credential program allows students to complete the requirements for a California Preliminary Single Subject Teaching Credential in one academic year and one summer. The California Preliminary Single Subject Teaching Credential is for the middle school or high school setting. The School offers the following single subject areas: English, Mathematics, Sciences (e.g. Biology, Chemistry, Geoscience, Physics) Social Science, and World Language (Spanish). Students must successfully complete their credential requirements to earn the certification. This program requires courses that are taken during summer sessions.

Course Work

The California Preliminary Single Subject Teaching Credential requires at least 30 to 50 units. Students will complete at least 30 units and an additional 4 to 20 units are required if a student has not previously completed the courses noted below with an asterisk

Required Courses:

1. EDUC 132*, EDUC 147*, EDUC 162*, EDUC 177* or EDUC 178*, EDUC 179A*, EDUC 333 or EDUC 334, EDUC 348A, EDUC 348B, EDUC 348C, EDUC 376A, EDUC 376B, EDUC 376C, EDUC 377A, EDUC 377B, EDUC 377C
2. One course from: EDUC 285 (E-Z)

* This course can be recognized if completed as part of an undergraduate program and approved by the Graduate Advisor.

Please see the Teacher Education section of the School of Education's website at education.ucr.edu to learn about the requirements, in addition to the coursework, listed that must be completed to earn the credential with the California Commission on Teacher Credentialing.

California Preliminary Single Subject Teaching Credential Internship

This credential program allows students to complete the requirements for a California Preliminary Single Subject Teaching Credential Internship in one academic year and one summer. The California Preliminary Single Subject Teaching Credential Internship is for the middle school or high school setting. The School offers the following single subject areas: English, Mathematics, Sciences (e.g. Biology, Chemistry, Geoscience, Physics) Social Science, and World Language (Spanish). Students must successfully complete their credential requirements to earn the certification.

Course Work
The California Preliminary Single Subject Teaching Credential Internship requires at least 42 units.

Required Courses:

1. EDUC 333 or EDUC 334, EDUC 348A, EDUC 348B, EDUC 348C, EDUC 377A, EDUC 377B, EDUC 377C, EDUC 378A, EDUC 378B, EDUC 378C
2. One course from: EDUC 285 (E-Z)

The following courses are required for teaching certification and are taken prior to admission to this program: EDUC 132, EDUC 147, EDUC 162, EDUC 177 or EDUC 178, EDUC 179A

Please see the Teacher Education section of the School of Education's website at education.ucr.edu to learn about the requirements, in addition to the coursework, listed that must be completed to earn the credential with the California Commission on Teacher Credentialing.

California Preliminary Education Specialist - Mild/Moderate Support Needs and Extensive Support Needs
This dual credential program allows students to complete the requirements for the California Preliminary Education Specialist - Mild/Moderate Support Needs and Extensive Support Needs Credentials in one academic year and one summer. The California Preliminary Education Specialist Mild/Moderate Support Needs and Extensive Support Needs Credentials are generally for those who want to be special education teachers. Students must successfully complete their credential requirements to earn the certifications. This program requires courses that are taken during summer sessions.

Course Work
The California Preliminary Education Mild/Moderate Support Needs and Extensive Support Needs Credentials requires 47 to 71 units. Students will complete at least 47 units and an additional 4 to 24 units are required if a student has not previously completed the courses noted below with an asterisk.

Required Courses:
EDUC 132*, EDUC 136*, EDUC 147*, EDUC 162*, EDUC 171* or EDUC 172*, EDUC 179A*, EDUC 282A, EDUC 282B, EDUC 287A, EDUC 287B, EDUC 331 or EDUC 334, EDUC 380A, EDUC 380B, EDUC 380C, EDUC 381A, EDUC 381B, EDUC 381C, EDUC 382A, EDUC 382B, EDUC 382C

* This course can be recognized if completed as part of an undergraduate program and approved by the Graduate Advisor.

Please see the Teacher Education section of the School of Education's website at education.ucr.edu to learn about the requirements in addition to the coursework listed that must be completed to earn the credential with the California Commission on Teacher Credentialing.

Lower-Division Courses

EDUC 001 Imagining Teaching 2 Lecture, 2 hours. Prerequisite(s): none. Considers images of teaching produced in popular culture, professional writing, and personal recollections, and how the images impact and reflect teaching in schools. Designed for lower-division students considering teaching as a career.

EDUC 002 Looking in Classrooms 3 Lecture, 2 hours; field, 3 hours. Prerequisite(s): EDUC 001 or EDUC 003. Involves observation in classrooms in local schools identified as having exemplary programs. Students record and interpret their observations and compare them to published studies of classrooms. Credit is awarded for only one of EDUC 002 or EDUC 004.

EDUC 003 Imagining Teaching: Science/Mathematics Emphasis 3 Lecture, 2 hours; field, 3 hours. Prerequisite(s): admission to the California Teach program; and consent of instructor. Considers images of teaching and how they impact teaching in schools. Addresses topics related to teaching mathematics and science in the K-12 classroom. Includes three hours per week of classroom observations, some of which takes place in public school classrooms.

EDUC 004 Looking in Classrooms: Science/Mathematics Emphasis 3 Lecture, 2 hours; field, 3 hours. Prerequisite(s): EDUC 003; admission to the California Teach program; consent of instructor. Involves observation in classrooms in local schools identified as having exemplary programs in mathematics and science. Students record and interpret their observations and compare them to published studies of classrooms. Designed for lower-division students who plan to teach mathematics or science in the public schools. Credit is awarded for only one of EDUC 002 or EDUC 004.

EDUC 005 Introduction to Education Studies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An overview of the field of education and learning inside and outside of the classroom. Introduces public policy and a critical perspective on the ideological and social construction of schools in the United States. Includes interpretations of learning conditions through student observations and experiences in varied educational and learning contexts.

EDUC 010 Principles of Learning Strategies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces attitudes and behaviors associated with successful learning and achievement. Compares research-based learning strategies in school, home, and multimedia with regard to different types of learners and topic areas. Credit is awarded for one of the following EDUC 010 or EDUC 010H.

EDUC 010H Honors Principles of Learning Strategies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors; or consent of instructor. Honors course corresponding to EDUC 010. Introduces attitudes and behaviors associated with successful learning and achievement. Compares research-based learning strategies in school, home, and multimedia with regard to different types of learners and topic areas. Credit is awarded for one of the following EDUC 010H or EDUC 010.

EDUC 019 (E-Z) Topics in Education 4 Lecture, 3 hours; discussion, 1 hour. Explores a topic of current theory, research, and issues in areas of education, society, and human development. Debate and dialog are the distinguishing features of this course. Topics are announced in the Schedule of Classes. E. Educational Psychology; I. Education, Society, And Culture; M. Education Policy Analysis And Leadership; N. Higher Education; P. School Psychology; S. Special Education. Course is repeatable as content or topic changes to a maximum of 16 units.

EDUC 023 Introduction to Education Policy 4 Lecture, 3 hours; discussion, 1 hour. An overview of federal and state policy frameworks governing public education. Explores the political dynamics of policy making. Focuses on centralized policy making authority and on efforts to reform and improve public schools. Explores competing values guiding policy debates and dilemmas of centralized policy control.

EDUC 024 Inequality in Educational Opportunity and Achievement 4 Lecture, 3 hours; discussion, 1 hour. Examines existing theories, research, and policies addressing disparities in educational opportunities and achievement among racial/ethnic, social class, and language groups--a problem now contentiously designated as the "achievement gap." Explores the incidences, consequences, and causes of these gaps and society's interest in eliminating the gaps.

EDUC 032A Introduction to Children With Special Needs 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): permission by department. Introduces variations in the development of children with special needs from birth through pre-adolescence and the resulting impact on families. Includes historical and societal influences, laws relating to children with special needs, and the identification and referral process for special education and related services. Includes field observations.

EDUC 032B Childhood Stress and Trauma 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Provides a comprehensive overview of concepts and issues related to childhood stress and trauma. Emphasizes the short-and long-term effects that stress and trauma have on the physical, cognitive, language, social, and emotional development of a child. Examines methods that support the child's coping skills and healing process and reviews how parents and practitioners can assist them.

EDUC 032C Sources and Treatments of Socio Emotional, Behavior, Or Conduct Problems in Young Children 4 Lecture, 3 hours; discussion, 1 hour; field, 10 or 12 hours per quarter. Prerequisite(s): permission

by department. Explores developmental, environmental, and other influences on the behavior of young children. Topics include principles for observing children, creating positive environments encouraging appropriate behavior, and effectively addressing many types of behaviors. Discusses proactive intervention and prevention techniques promoting positive teacher relationships with young children are discussed. Outside observations required.

EDUC 041 Culture, Power, and School Knowledge 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines school knowledge as the product of struggles over cultural power and social legitimacy. Provides conceptual tools for developing critical understandings of school knowledge, reviews research addressing the representation, inclusion, and exclusion of diverse groups in school curriculum, and examines public controversies over school curriculum.

EDUC 042 Education For Critical Consciousness 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces critical consciousness from an interdisciplinary perspective as it relates to the role of education in schools and society. Critiques various conventional approaches in education while exploring various transformative approaches, particularly for the purposes of developing critically conscious educators who work for educational equity and transformation in education.

EDUC 043 Historical and Contemporary Inequities in Us Education 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces the history and philosophy of public education in the United States. Focuses on the political economy, dominant ideologies, and existing educational practices that have precedents in various historical eras. Explores the history of education of girls and women, people of color, minority groups, and people of varying socioeconomic classes.

EDUC 044 Principles of Healthful Living 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): none. Introduction to personal, family, and community health. Discusses the attitudes and behaviors associated with healthful living and the use of health-related scientific information. Explores the effects of alcohol, dangerous drugs, narcotics, degenerative and infectious diseases, and tobacco on the human body and the community resources available to assist in their treatment.

EDUC 050 Intercollegiate Athletics and American Higher Education 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces intercollegiate athletics as an organization including its structure and function. Explores the role of intercollegiate athletics in higher education from historical, sociological, economic, and administrative perspectives. Focuses on contemporary issues including student-athlete experience as well as the roles of faculty, students, coaches, and administrators and the various emerging challenges.

EDUC 051 Introduction to Higher Education: Current Issues and Debates 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces critical issues confronting contemporary U.S. higher education. Focuses on three major themes: debates over the purpose of higher education; the context and main challenges institutions and students currently face; and how the current environment is likely to shape the future of higher education.

EDUC 052 Black Brilliance Matters: the History, Experience, and Scholarship of Blacks in Higher Education 4 Lecture, 3 hours; discussion, 1 hour. Explores historical and contemporary issues faced by Black students, faculty, staff, and administrators in higher education. Topics include history and importance of, theoretical and conceptual frameworks related to, and challenges and opportunities experienced by Black institutional stakeholders in higher education.

EDUC 061 Introduction to Human Development 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Discusses the development of physical, social, and cognitive processes from infancy to young adulthood. Physical topics include genetics, prenatal, and motor development. Cognitive processes include perception, attention, and memory and language development. Social processes include topics such as attachment, moral development, aggression, peer relationships, and the family.

EDUC 093A First-Year Seminar: Introduction to the Major and Univeristy 2 Seminar, 2 hours. Prerequisite(s): Restricted to class level standing of freshman; Restricted to major(s) Education, Society, Human Dev. Introduces the Education major. Provides opportunities to engage with Education faculty and learn about research. Introduces community learning options. Explores the structure and culture of university environment and the various support systems in place. Learn about student success strategies and consult with advisors for support. Graded Satisfactory (S) or No Credit (NC).

EDUC 093B First Year Seminar: Exploring Opportunities For Success 1 Workshop, 1 hour. Prerequisite(s): EDUC 093A with a grade of S or better; restricted to major(s) Education, Society, Human Dev. Delves deeper into the support structures and opportunities on campus. Engages in short- and long-term goal setting. Explores student success strategies and building community in the cohort. Continues the opportunities to receive structured support and consultation from advisors. Graded Satisfactory (S) or No Credit (NC).

EDUC 093C First Year Seminar: Community of Learners 1 Workshop, 1 hour. Prerequisite(s): EDUC 093B with a grade of S or better; restricted to major(s) Education, Society, Human Dev. Explores learning options during the academic year and summers. Discusses the significance of on- and off-campus research and community engagement opportunities. Continues discussions of student success strategies, building community, and the structured opportunities to receive support and consultation with advisors. Graded Satisfactory (S) or No Credit (NC).

EDUC 094 Transfer Seminar: Exploring the Tools and Opportunities For Student Success 2 Seminar, 2 hours. Prerequisite(s): restricted to major(s) Education, Society, Human Dev; or consent of instructor. Introduces transfer students to the Education major. Provides opportunities for engaging with Education faculty and learn about research. Explores university environment and opportunities for student success. Explores student success strategies and introduces opportunities to consult with advisors for support. Explores opportunities to broaden intellectual and professional opportunities in education. Graded Satisfactory (S) or No Credit (NC).

Upper-Division Courses

EDUC 102 Democratic Pedagogy: Developing R'courses 1 Workshop, 1 hour. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; and consent of instructor. Supports the R'Course process of student-facilitated, shared, active learning. Provides opportunities for student facilitators to discuss pedagogical theory and prepare meaningful resources to put into practice. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content or topic changes to a maximum of 4 units.

EDUC 103W Mindfulness Approaches to Academic Writing in Education 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in WRIT 040M; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; EDUC 005 with a grade of C- or better; or equivalent; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introduces mindfulness and humanity-centered approaches to writing about issues in education. Develops individual abilities to cultivate and sustain healthy writing practices. Fosters a constructive and welcoming space for peer feedback. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits as alternatives to WRIT 030.

EDUC 104 Mathematics Education 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. Examines contemporary instructional strategies relating to mathematics education. Includes thinking skills and problem solving strategies applicable to number theory, logic patterns and functions, statistics, probability, geometry, and algebra.

EDUC 105 Introduction to Science Pedagogy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Introduction to contemporary theoretical pedagogical teaching

strategies. Includes the application to teaching science education in the classroom for the twenty-first century. Covers the understanding of required Common Core State Standards (CCSS) and integration with Next Generation Science Standards (NGSS).

EDUC 109 (E-Z) Special Topics in Education 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): EDUC 005 with a grade of C- or better, EDUC 010 with a grade of C- or better; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Explores a topic of current theory, research, and issues in areas of education, society, and human development. Includes the distinguishing features of debate and dialog in a smaller group setting. E. Educational Psychology; I. Education, Society, And Culture; M. Education, Policy, Analysis & Leadership; N. Higher Education Administration And Policy; P. School Psychology; S. Special Education. Course is repeatable as content or topic changes to a maximum of 8 units.

EDUC 118 Educational Research Methods 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; restricted to major(s) Education, Education, Society, Human Dev; Minor in Education; or consent of instructor. Explores preliminary considerations that go into selecting a qualitative, quantitative, and mixed methods research design. Examines educational research from various paradigms.

EDUC 119 (E-Z) Topics in Education 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Explores a topic of current theory, research, and issues in areas of education, society, and human development. Debate and dialog are the distinguishing features of this course. Topics are announced in the Schedule of Classes. E. Educational Psychology; I. Education, Society, And Culture; M. Education Policy Analysis And Leadership; N. Higher Education; P. School Psychology; S. Special Education. Course is repeatable as content or topic changes to a maximum of 16 units.

EDUC 122 Education, Digital Media, and Democratic Engagement 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 005 with a grade of C- or better or EDUC 010 with a grade of C- or better or EDUC 010H with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Examines studies of youth civic and political engagement and how such engagement is changing in the digital age. Presents and evaluates varied ways educators can support more, more equitable, and effective democratic engagement in the digital age.

EDUC 123 School Effectiveness and Educational Equity 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduction to the research literature on teacher and school factors that impact student achievement and educational equity. Covers a multitude of factors and seeks to gauge the relative effect of each factor. Credit is awarded for one of the following EDUC 123 or EDUC 245K.

EDUC 132 The Exceptional Child 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, senior, credential only, or masters. Explores characteristics of individuals with physical and mental disabilities. Includes emotional disturbance, visual or hearing impairments, gifted and talented students, and children with characteristics of autism. Emphasizes educational programs and considers the effect of gender, socioeconomic, ethnic, and linguistic factors.

EDUC 134 Abnormal Psychology For Educators 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A study of abnormal psychology for educators. Topics include how psychologists categorize and diagnose a variety of disorders in school-aged children, how to support these students in the classroom, and potential difficulties that may be faced in the classroom or educational setting.

EDUC 136 Educational Assessment of Individuals With Disabilities 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EDUC 132 with a grade of C- or better; Restricted to class level standing of junior, senior, credential only, or masters; or consent of instructor. Teaches the principles and techniques of assessment and educational planning for children with disabilities. Examines the value and usefulness of a broad range of assessment and record-keeping tools in general and special education.

EDUC 141 Historical and Contemporary Perspectives On Lgbtq Students and Faculty 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines historical and cultural meanings of homosexuality, heterosexuality, sex, and gender. Explores the historical experiences of LGBTQ students, teachers, and faculty from the early 20th century to the present. Explores current issues regarding LGBTQ students and teachers, including the California requirement to incorporate LGBTQs into the K-12 curriculum.

EDUC 142 Language and Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 005 with a grade of C- or better or EDUC 043 with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Focuses on the relationships between language and society: the connections between language and cultural values; the intersection between language and social structure; the ways in which power relationships are reflected, reinforced and resisted by language practices; and how language is used to construct social identities.

EDUC 144 Constructing Success and Failure in K-12 Schools 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 005 with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Examines educational research addressing how structural arrangements and cultural processes in schools contribute to the academic success and failure of students based on racial, ethnic, class, gender, and linguistic differences.

EDUC 145 Black Language in Schools and Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores linguistic, sociolinguistic, and sociopolitical dimensions of Black language in the United States. Considers the relationship between Black language and Blackness. Critically interrogates the role of Black language in classroom instruction, schools, and society. Encourages liberatory learning engagements and centers the lived experiences of Black language speakers. Cross-listed with BLKS 145.

EDUC 146 Educational Perspectives On the Chicano 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An examination of educational policy issues concerning Chicano students, such as testing and testing procedures, learning styles, socialization, and language acquisition. Other topics will deal with the impact of significant legislative acts related to the education of Chicanos. Cross-listed with ETST 146.

EDUC 147 Education in A Diverse Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, senior, credential only, or masters. An analysis of the classroom as a microcosm of society. Focuses on issues related to meeting the educational needs of students with diverse backgrounds and characteristics including gender, religion, ability, ethnicity, culture, socioeconomic status, class, exceptionality, and language.

EDUC 148 Critical Race Theory and K-12 Schools 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): EDUC 147 with a grade of C- or better; Restricted to class level standing of junior, or senior; or consent of instructor. Introduces the framework of Critical Race Theory. Guidance through a comprehensive analysis of racism and racial justice in schools and learning to develop racial literacies and research capacities.

EDUC 149 Ethnic Studies in K12 Contexts 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 005 with a grade of C- or better or EDUC 043 with a grade of C- or better; restricted to class level standing of junior, or senior; completion of EDUC 147 with a grade of C- or better is recommended; or consent of instructor. Examines a brief historical genealogy of Ethnic Studies as a field of study. Provides opportunities to broaden content and pedagogical knowledge of Ethnic Studies approaches in K-12 school settings. Reviews the existing empirical research of the inclusion of Ethnic Studies literacies and pedagogies in U. S. public schools.

EDUC 150 Policy and Legal Issues in Intercollegiate Athletics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-

division standing or consent of instructor. Examines policy and legal issues associated with intercollegiate athletics. Emphasis will be placed on NCAA and member policies and principles as well as ongoing litigations and landmark judicial decisions affecting athletics. Students will approach these issues from the perspective of various stakeholders, including researchers, university leaders, regulatory bodies, and athletes.

EDUC 151 Wo/Men Who Control Our Universities: Leadership, Administration,and Governance in Higher Education 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 051 with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Introduces an overview of the leadership, administration, and governance required for the control of higher education institutions. Provides an opportunity to better understand the people in charge of higher education and how they lead.

EDUC 152 Education, Hip-Hop, and Sport 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Draws connections between education, hip-hop culture, and sport. Special emphasis is placed on the ways in which education and sport are inextricably linked to hip-hop culture. Consideration is also given to the complex, interconnected relationships between sport and hip-hop and topics such as race, inequality, and politics within institutional settings.

EDUC 153 Whiteness, Power, and Privilege 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 147 with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Explores race, racialization, and racism through the lens of critical whiteness studies and critical race theory. Sheds light on white racial identity development and reveals how racism and white supremacy render us un-whole. Includes a diverse range of topics related to whiteness, power, and privilege.

EDUC 154 Educational Leadership in A Diverse Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines issues impacting leadership in diverse educational contexts. Inquiries into demographic shifts, globalization, technology, evidence-based decision-making, organizational culture, community engagement, and equity and inclusion of diverse learners.

EDUC 155 Reimagining Education Through Critical and Decolonial Perspectives 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 005 with a grade of C- or better; restricted to class level standing of junior, or senior; completion of EDUC 147 with a grade of C- or better recommended; or consent of instructor. Explores critical and decolonial (including intersectional feminists) ways of knowing as liminal, embodied, and generative. Critically centers the experiential knowledge of Black, Indigenous, and People of Color in reimagining education and social life. Offered online only.

EDUC 156 The Community College 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introduces the origins and contemporary role of the American community college system. Explores issues related to access, persistence, diversity, equity, campus climate, technology, and internationalization influencing community colleges.

EDUC 157 Student Activism, Campus Racial Climate, & Placemaking 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Introduces the relationship between student activism and campus spaces. Topics include student activism, campus racial climate, and theories of placemaking. Offered Online Only.

EDUC 160 Cognitive Development and Education 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 010 with a grade of C- or better or EDUC 010H with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Provides an overview of the major themes of cognitive development within the educational context. Include the development of memory, abilities, motivation, language, and math skills. Explores the use of cognitive developmental changes within a variety of educational contexts.

EDUC 161 Social Development in Education 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 010 with a grade of C- or better or EDUC 010H with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Discusses the processes involved in the development of social behaviors from birth to young adulthood. Discusses issues concerning attachment, family systems, peer relationships, aggression, prosocial behavior, and self-concept within the educational context. Presents theories and scientific research in a context of practical application.

EDUC 162 Learning Theory and Psychology in Education 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, senior, credential only, or masters. Covers the study of stages of intellectual development; principles of learning; the dynamics of human behavior; learner and cultural differences as they relate to modern curricula and instruction; and the role of motivation and self-concept in the learning process.

EDUC 171 Reading and Language Development 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, senior, credential only, or masters; permission by department. An introduction to reading and language development. Addresses theoretical models of reading; linguistics and language development; methods and materials; children's and adolescents' literature; reading in the content areas; individual differences; and measurement and evaluation in reading. Includes observation and participation in assigned schools. Credit is awarded for one of the following EDUC 171 or EDUC 172.

EDUC 172 Reading and Language Development 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, senior, credential only, or masters; permission by department. An introduction to reading and language development. Addresses theoretical models of reading; linguistics and language development; methods and materials; children's and adolescents' literature; reading in the content areas; individual differences; and measurement and evaluation in reading. Includes observation and participation in assigned schools. Credit is awarded for one of the following EDUC 172 or EDUC 171.

EDUC 177 Reading and Writing in the Content Areas 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, senior, credential only, or masters; permission by department. An examination of reading, writing, academic language, and English language development strategies for teaching at the middle and high school levels. Covers all areas of the curriculum. Includes observation and participation in public schools. Credit is awarded for one of the following EDUC 177 or EDUC 178.

EDUC 178 Reading and Writing in the Content Areas 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, senior, credential only, or masters; permission by department. An examination of reading, writing, academic language, and English language development strategies for teaching at the middle and high school levels. Covers all areas of the curriculum. Includes observation and participation in public schools. Credit is awarded for one of the following EDUC 178 or EDUC 177.

EDUC 179A Language Development in the Content Areas For Diverse Students 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, senior, credential only, or masters. Addresses analysis, planning, execution, and evaluation of content area instruction in specialized and general education settings that integrate reading and writing. Includes Integrated and Designated English Language Development for diverse students.

EDUC 179B Language Development in the Content Areas in Dual Language Immersion Classrooms 4 Lecture, 3 hours; research, 1 hour; field, 2 hours. Prerequisite(s): EDUC 179A with a grade of C- or better; restricted to class level standing of junior, senior, credential only, or masters; permission of department. Explores the analysis, planning, execution, and evaluation

of empirical and theoretical foundations of dual language immersion programs and instructional strategies for English and partner language development. Includes content area instruction in English and the partner language. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following EDUC 179B or EDUC 286.

EDUC 181 Introduction to Applied Behavior Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 005 with a grade of C- or better or EDUC 010 with a grade of C- or better or EDUC 010H with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Introduction to the foundational knowledge and skills in Applied Behavior Analysis. Topics include the roots of Applied Behavior Analysis, key concepts in respondent and operant behavior, and their relevance to school and clinical settings. Discusses basic principles of prevention and intervention for mild to severe problem behaviors.

EDUC 182 Behavioral Interventions in the Schools 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 010 with a grade of C- or better or EDUC 010H with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. An introduction to the professional practice of applied behavior analysis (ABA) in K-12 school settings. Topics include ethical practice, assessment, and intervention. Presents relevant behavior principles and procedures focusing on their incorporation in educational programming for children and adolescents.

EDUC 183 Psychology in the Schools 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 010 with a grade of C- or better or EDUC 010H with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Examines psychological phenomena in schools. Includes the interplay between students, teachers, and schools; the work of school psychologists and other school-based professionals; and special topics such as exceptional children, bullying, crisis intervention, and school violence prevention.

EDUC 184 Social Emotional Learning in the Schools 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EDUC 010 with a grade of C- or better or EDUC 010H with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. An overview of fostering social emotional competence in PK-12 settings. Topics include cultural adaptations, generalization and maintenance, and trauma in the schools.

EDUC 190 Special Studies 1 to 5 Research, 3 to 15 hours. Prerequisite(s): restricted to class level standing of junior, or senior; consent of the Associate Dean of Undergraduate Education Programs of the School of Education; and consent of instructor. Independent study and research in education. Course is repeatable to a maximum of 12 units.

EDUC 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; consent of primary academic advisor; and consent of instructor. Original research conducted under Education faculty supervision. Topics vary based upon the research focus of the instructor. Requires a formal oral presentation, poster project, written report, or paper. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

EDUC 198 R'course: Variable Topics 1 Activity, 3 hours. Prerequisite(s): none. An opportunity to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original course topics are variable and unique from other departmental course offerings. Designed to highlight the student facilitators' expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content or topic changes to a maximum of 8 units.

EDUC 198G Group Internship 1 to 12 Seminar, 1 hour; internship, 2 to 32 hours; written work, 1 hour. Prerequisite(s): upper-division standing; consent of instructor. On- or off-campus group internship related work in a community organization/district under the joint direction of an on- or off-campus supervisor and an Education faculty member. Requires a report based on the experience. Course is repeatable to a maximum of 16 units.

EDUC 198I Individual Internship 1 to 12 Seminar, 1 hour; internship, 2 to 32 hours; written work, 1 hour. Prerequisite(s): upper-division standing; consent of instructor. On- or off-campus individual internship related work in a community organization/district under the joint direction of an on- or off-campus supervisor and an Education faculty member. Requires a report based on the experience. Course is repeatable to a maximum of 16 units.

Graduate Courses

EDUC 200 Human Differences 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): EDUC 212 or equivalent. Covers dimensions of individual differences, varieties of group differences, and factors producing differences in development.

EDUC 202A Democracy and Education 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): restricted to major(s) Education; graduate standing; or consent of instructor. An introduction to the democratic purposes of education. Focuses on education?s role in preparing youth for active, thoughtful, equitable, and effective participation in a democratic society. Highlights the challenges and opportunities associated with societal changes such as the digital revolution, increasing student diversity, and sizable partisan divisions. Credit is awarded for one of the following EDUC 202A or EDUC 202B.

EDUC 202B Democracy and Education in K12 Contexts 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): restricted to major(s) Education, Education, Special Education Teaching; graduate standing; or consent of instructor. An introduction to the democratic purposes of education in K-12 contexts. Focuses on education's role in preparing youth for active, thoughtful, equitable, and effective participation in a democratic society. Highlights the challenges and opportunities associated with societal changes such as the digital revolution, increasing student diversity, and sizable partisan divisions. Credit is awarded for one of the following EDUC 202B or EDUC 202A.

EDUC 203 History of American Education 4 Lecture, 3 hours. Prerequisite(s): consent of instructor. A study of American educational history from 1830 to the present.

EDUC 205 Economics of Education 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): EDUC 214B or equivalent; consent of instructor. Examines the insights economists have brought to the education policy debate. Covers basic microeconomic theory and its application to private and social returns to education, education production, costs, and financing of education, teachers and teacher labor markets, and education markets, school choice, and incentives.

EDUC 209 Education Policy Analysis 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Examines major issues and reform movements in public education that are at the forefront of the national policy agenda today. Views each educational reform issue in light of its connection to four themes driving reform efforts: equity, adequacy, autonomy, and accountability. Credit is awarded for one of the following EDUC 209 or PBPL 260.

EDUC 210 Sociology of Education 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Introduces students to key sociological theories and empirical research on schooling and social inequality. This is a diverse subfield of sociology, focusing on how social forces create variation in school practices, and how variation in school practices affects individual student achievement, behavior, and life course outcomes.

EDUC 211A Cognitive Development 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Survey course on theories, issues, applications, and contemporary research related to cognitive development across several major developmental periods, including childhood, adolescence, and early adulthood.

EDUC 211B Social Development 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys social development during childhood and adolescence. Topics include individuality and self, peer relations, adult-child relations, self-system beliefs and attitudes, and achievement motivation. Special attention is paid to issues as they relate to socialization at school.

EDUC 212 Research Methods 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers principles of scientific research including historical, survey, descriptive, correlational, experimental, and quasi-experimental methods, as well as internal and external threats to validity. Credit is awarded for only one of EDUC 212 or EDUC 248T.

EDUC 214A Introduction to Quantitative Methods 4 Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): restricted to major(s) Education; first-year standing in the Ph.D. program in Education; graduate standing; or consent of instructor. Introduces descriptive statistics and fundamentals of statistical inference in educational research. Topics include sampling theory, normal and z-distributions, hypothesis testing, confidence intervals, central limit theorem, t-tests, correlation, simple regression, and chi-square.

EDUC 214B Multiple Regression Analysis 5 Lecture, 3 hours; laboratory, 3 hours; written work, 3 hours. Prerequisite(s): EDUC 214A; graduate standing; or consent of instructor. Introduces techniques and assumptions of regression models and analysis. Topics include ordinary least squares, logistic regression, continuous and categorical predictors, interaction effects, and effect size.

EDUC 214C Experimental Design 5 Lecture, 3 hours; laboratory, 3 hours; research, 3 hours. Prerequisite(s): EDUC 214B; graduate standing; or consent of instructor. Introduces experimental and quasi-experimental designs. Topics include factorial, repeated measures, analysis of covariance, and mixed designs.

EDUC 215 Educational and Psychological Measurement and Evaluation 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EDUC 214C with a grade of B or better; graduate standing; or consent of instructor. Examines advanced topics in educational measurement including generalizability theory and item response theory. Emphasizes the statistical basis of these theories and their application in educational and psychological settings.

EDUC 216A Structural Equation Modeling 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): EDUC 214C with a grade of B or better; graduate standing; or consent of instructor. Introduction to structural equation modeling (SEM) techniques. Emphasizes theory, application, and interpretation of techniques. Addresses development in the use and interpretation of specialized software. Topics include confirmatory factor analysis, covariance structure analysis, structural regression models, and latent change analysis. Considers model definition and specification, identification, estimation, and testing.

EDUC 216B Multilevel Modeling 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EDUC 214B with a grade of B or better; graduate standing; or consent of instructor. Covers the processes involved in conceptualizing, conducting, interpreting, and composing multilevel analyses. Includes ANOVA and ANCOVA with random effects, means-as-outcomes, random-coefficients, intercepts and slopes as outcomes, and growth models. Also addresses model building and assessment, centering, estimation, hypothesis testing, contextual and compositional effects, and other related topics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EDUC 216C Causal Modeling in Education 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): EDUC 214B with a grade of B or better; graduate standing; or consent of instructor. Overview of methods for estimating causal effects in social research. Topics include randomized experiments, regression discontinuity, interrupted time series, difference-in-differences, instrumental variables, matching, and fixed effects. Focuses on statistical theory, data requirements, and appropriate applications. Applies methods through assignments analyzing real data.

EDUC 217 Single-Case Experimental Design 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to major(s) Education; graduate standing; or consent of instructor. Covers methodological considerations for engaging in defensible causal inference using single-case design. Discusses applicable issues in causality, design, measurement, analysis, and synthesis. Emphasizes skills in independently designing and conducting single-case research.

EDUC 218 Problems in Evaluation 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. A study of policies and procedures that define program evaluations in education. Topics include evaluation models, formative and summative strategies, evaluation designs and analyses, and ethical issues.

EDUC 219 Classroom and School Assessment 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Survey course in classroom and school assessment. Covers basic principles of measurement including test administration, construction, scaling, norming, reliability, validity, and interpretation of individual and group tests.

EDUC 220A Sociocultural Theory and Education 4 Seminar, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Explores sociocultural perspectives in relation to teaching, learning, students, teachers, and others in schools and other learning environments. Considers issues of knowledge, skills, values, power, and privilege as seen through sociocultural theory and research.

EDUC 220B Sociocultural Theory and Education 4 Seminar, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): EDUC 220A; graduate standing; or consent of instructor. Continues the exploration of sociocultural perspectives in relation to teaching, learning, students, teachers, and others in schools and other learning environments. Considers issues of knowledge, skills, values, power, and privilege as seen through sociocultural theory and research.

EDUC 221A Introduction to Qualitative Methods 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): restricted to major(s) Education; graduate standing; or consent of instructor. Introduces qualitative research studies. Identifies phenomena of interest and develop research questions. Engages in theoretical and empirical literature for the purposes of conceptual framing and contextualizing research topics within extant literature. Includes design of a small-scale pilot qualitative study.

EDUC 221B Intermediate Qualitative Research Methodologies in Education 5 Seminar, 3 hours; research, 6 hours. Prerequisite(s): EDUC 221A; graduate standing; or consent of instructor. Focuses on the theoretical underpinnings of qualitative research methodologies and their use in designing, conducting, and representing research.

EDUC 221C Advanced Qualitative Research Methodologies in Education 5 Seminar, 3 hours; research, 6 hours. Prerequisite(s): EDUC 221A, EDUC 221B; doctoral standing; graduate standing; or consent of instructor. Analyzes data previously collected during qualitative research course sequence or dissertation data. Engages in multiple coding processes. Constructs assertions grounded in data that utilize theoretical frameworks as analytic tools. Course is repeatable to a maximum of 15 units.

EDUC 225 Chicana/O Curricula K-12: Theory Into Praxis 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Overview of academic literatures in critical pedagogy, critical race theory, bilingual, multicultural, and Chicana/o education. Contextualizes theory with K-12 practice. Includes collaborative creation of grade-level standards-aligned curricula focused on Chicana/o communities and engaging critical theories in praxis.

EDUC 226 Ethnic Studies and Education 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces a brief historical genealogy of Ethnic Studies as an interdisciplinary academic field. Presents content and pedagogical knowledge of Ethnic Studies in K- 12 school settings. Reviews the existing research of Ethnic Studies literacies in U.S. public schools.

EDUC 227 Educational Change and Innovation 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The study of change and innovation in the public school. Emphasis is placed on (a) the organizational environment of the school which must accommodate the innovation, (b) specific strategies of change, and (c) contemporary educational innovations.

EDUC 230 (E-Z) Science Technology Engineering and Mathematics Education 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. A selection of courses for studies on science, technology, engineering, and mathematics education. For hours and

prerequisites, see segment descriptions.

EDUC 230E Ethnomathematics and Stem Education 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. A study of the non-European origins of mathematics and science and their implications on science, technology, engineering, and mathematics (STEM) education. Includes the histories of mathematics and STEM fields. Contrasts the implications of their epistemic groundings on modern mathematics and STEM education's systems and practices.

EDUC 230G Gender Equity in Stem 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Surveys factors contributing to or mitigating the barriers to achieving gender parity in science, technology, engineering, and mathematics (STEM) domains. Explores the research interventions that can broaden understanding and equitable participation.

EDUC 230L Cognitive and Affective Learning 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Surveys cognitive and affective factors relevant to teaching and learning in science, technology, engineering, and mathematics (STEM) content. Explores the research interventions that can broaden understanding and participation.

EDUC 230M Multimedia and Artificial Intelligence 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Surveys the use of multimedia and artificial intelligence (AI) technologies as part of teaching and supporting learning. Explores the research on how using these technologies broadens understanding and equitable participation in science, technology, engineering, and mathematics (STEM) content.

EDUC 230R Race and Language Challenges 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Surveys exploration of the racial, cultural, and linguistic challenges and perspectives that impact science, technology, engineering, and mathematics (STEM) teaching and learning. Explores the research interventions that can broaden understanding and promote diversity and inclusiveness.

EDUC 233 Differential Achievement and the School Learning Environment 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing. Explores how racial, ethnic, linguistic, cultural, and socioeconomic differences in educational achievement are a product of the learning environments experienced in schools and classrooms.

EDUC 238 Education and Gender 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the multiple and complex relationships of gender and education in U.S. society. Analyzes theoretical perspectives on gender and schooling. Topics include cultural constructions of identity, male and female experiences of schooling, and concepts of gender neutrality in the curriculum.

EDUC 239 Developmental Psychopathology 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing in Education or Psychology or consent of instructor. Examines the origins of psychopathology from multiple theoretical perspectives with a specific focus on childhood disorders. Topics include biological and environmental contributions to disorder development and treatment paradigms.

EDUC 240 Educational Psychology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EDUC 162; or equivalent; graduate standing; or consent of instructor. Overview of the major empirical and theoretical bases of educational psychology, followed by detailed analysis of the following topics: (a) cognition and metacognition as applied to school learning and instruction; (b) motivation, student perceptions, teacher perceptions, classroom processes; (c) effective teaching; and (d) evaluation.

EDUC 245 (E-Z) Review of Research Literature in Education 4 Prerequisite(s): graduate standing. Critical analyses of research in the various areas of education.

EDUC 245E History of Church, State, and Schooling 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Overview of the historical roles of religion in the origins and development of public schooling in the United States and the establishment of private religious schooling. Examines the historical roots of contemporary issues of schooling, church, and state, including school prayer, creationism and evolution debates, and censorship.

EDUC 245G Inequality in Educational Opportunity and Achievement 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Examines theoretical and empirical research on the "achievement gap" from a variety of social science disciplines. Explores causes and consequences of racial or ethnic, linguistic, cultural, and socioeconomic differences in educational achievement.

EDUC 245J School Effects 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing. A review of the research literature on effective schools. Covers historical background, practices, resources, structures, student body characteristics, sources of socioeconomic and racial inequality, and assessing school performance.

EDUC 245K School Effects and Equity 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to major(s) Education; graduate standing; or consent of instructor. A review of the research of school and teaching factors contributing to student achievement and inequity. Topics include teacher characteristics, instructional practices, school finance and resources, curriculum, and sources of opportunity gaps. Offered online only. Credit is awarded for one of the following EDUC 245K or EDUC 123.

EDUC 245L Transformative Leadership: Strategies For Equity and Change in K-16 Education 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. An exploration of educational leadership theories, practices, and issues in both K-12 and higher education settings. Examines the unique challenges and opportunities faced by leaders in these two sectors. Covers topics including educational policy, organizational management, instructional leadership, student engagement, and equity and diversity.

EDUC 246 (E-Z) Research On Education of Exceptional Children 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Intensive study of current research on the education of exceptional children. E. Autism Spectrum Disorders In The Classroom; F. Emotional And Behavior Disordes; I. Learning Disabilities; J. Contemporary Issues And Trends; K. Autism Spectrum Disorders; L. Behavioral Phenotypes; M. Multicultural Education; N. Early Intervention; O. Family Influence On Developmnt; P. Adolescent Literacy Interventions; R. History Of Special Education; S. Sources And Treatments Of The Reading Difficulties Of Students With Disabilities; T. Brain And Behavior.

EDUC 248 (E-Z) Higher Education 4 Prerequisite(s): graduate standing. For hours and prerequisites, see segment descriptions. A selection of courses for studies on higher education.

EDUC 248E Race, Meritocracy, and Dilemmas of Diversity in Higher Education 4 Seminar, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. An introduction to theoretical perspectives of diversity in U.S. higher education. Explores the implications of demographic shifts on U.S. postsecondary educational practice and policy. Reviews the research literature on the impact of diversity on educational outcomes for college students, faculty, and administrators.

EDUC 248F Financing Higher Education 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides an overview of finance and economics of higher education in the United States. Examines economic theories as they apply to higher education finance and the distributive implications of various financing strategies. Covers main trends and current debates and how to identify political-economic rationales behind financing policy choices in higher education.

EDUC 248G Higher Education Governance 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to the organization and governance of higher education. Covers diverse forms of organization and governance in contemporary public and private higher education in the United States. Also addresses alternative

theoretical frames through which to view postsecondary governance structures (both internal and external to institutions).

EDUC 248I Critical Issues in Higher Education 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines internal and external issues that face higher education institutions.

EDUC 248J Higher Education Policy 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces a range of contemporary higher education policy issues and the conceptual and theoretical frameworks used to understand these issues. Develops fluency in using public policy language in the higher education setting. Addresses critical understanding of policy analysis, economics, and political science papers in higher education.

EDUC 248K The Dissertation and the Proposal in Education 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Enhances skills in evaluating and critiquing research through written and oral communication. Includes completion of dissertation proposal in the field of education. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable up to a maximum of 12 units.

EDUC 248L Administration and Governance of the Community College 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Focuses on the administration and governance of the community college. Addresses theoretical perspectives on institutions and organizations with application to management including unionized contexts. Includes student-led seminars that examine scholarly literature and specific community college cases.

EDUC 248M The Community College 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Analyzes current literature on community colleges.

EDUC 248N Higher Education Scholarship and Literature Review 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Utilizes scholarship in higher education to review literature on specific topics in the field as well as develop these topics for research.

EDUC 248O Organization and Administration in Higher Education 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines theory, research, and literature on higher education organizations and their management.

EDUC 248P Historical Perspectives On Campus Life 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines historical perspectives on campus life in the United States from the view of the students, faculty, administrators, and employees. May address the general environment, curriculum, student activities and clubs, athletics, town-gown relationships, or other aspects.

EDUC 248Q Foundations of Student Services 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the field of student services and student affairs in higher education institutions. Focuses on the historical and philosophical foundations of the field, as well as guiding theories and models of practice. Addresses contemporary challenges for student services practitioners.

EDUC 248R College Student Development 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Addresses student development in higher education institutions. Focuses on developmental theories applicable to college students. Examines institutional behaviors and actions (including policy) related to student development.

EDUC 248S The College Student 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Analysis of current literature on diverse populations of students in colleges and universities. Examines contextual and personal factors shaping the college experience. Focuses on students' multiple identities and challenges.

EDUC 248T Understanding Research in Higher Education 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the strengths and limitations of research methods used in higher education research. Explores data collection and research design. Also evaluates scholarly research publications. Credit is awarded for only one of EDUC 212 or EDUC 248T.

EDUC 248U History of Higher Education in the United States 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Overview of the growth and development of institutions of higher learning in the United States, from the colonial colleges to the multipurpose research institutions of today, including academies, community colleges, and professional schools.

EDUC 248V Campus Environments, Climate, and Culture 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces the study of how institutions impact students through the environments, cultures, and climates they make available. Topics include organizational and higher education theories of how universities structure environments and campus cultures and the manner in which climates shape experiences, behaviors, and outcomes.

EDUC 248W Whiteness, Power, and Privilege 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Explores race, racialization, and racism through the lens of critical whiteness studies and critical race theory. Sheds light on white racial identity development and reveals how racism and white supremacy render us un-whole. Includes a diverse range of topics related to whiteness, power, and privilege.

EDUC 250 Professional Issues and Responsibilities in School Psychology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to major(s) School Psychology; graduate standing; or consent of instructor. Provides a comprehensive overview of the field of school psychology, the roles and functions of school psychologists, ethical standards, federal and state legal standards, and supervision models and theory in psychology.

EDUC 251 Seminar in Cognitive Development 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): EDUC 211A or equivalent; graduate standing; or consent of instructor. Seminar on current issues in cognitive development. Topics include metacognition, Vygotskian theory, and cultural factors in cognitive development. Special attention will be paid to issues as they relate to the learning and teaching of school subjects.

EDUC 252 Introduction to Applied Behavior Analysis 4 Lecture, 3 hours; term paper, 1.5 hours; extra reading, 1.5 hours. Prerequisite(s): restricted to major(s) Education; graduate standing; or consent of instructor. Introduction to the foundational knowledge and skills in Applied Behavior Analysis. Topics include the roots of Applied Behavior Analysis, key concepts in respondent and operant behavior, and their relevance to school and clinical settings. Discusses basic principles of prevention and intervention for mild to severe problem behaviors.

EDUC 254A Cognitive Assessment For School Psychologists 4 Seminar, 3 hours; practicum, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in School Psychology; graduate standing; or consent of instructor. Covers the administration, scoring, and interpretation of individual measures of intelligence and academic aptitude. Emphasizes the use of these measures for screening and classification decisions, as well as psychological report writing.

EDUC 254B Academic Assessment 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in School Psychology or Special Education; graduate standing; or consent of instructor. Covers the administration, scoring, and interpretation of individual norm-referenced measures of academic achievement, perceptual-motor skills, and adaptive behavior. Emphasizes the use of these instruments for screening and classification decisions, as well as psychological report writing.

EDUC 254C Social, Emotional, and Behavioral Assessment 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program specialization in School Psychology or Special Education;

graduate standing; or consent of instructor. Covers procedures and techniques of behavioral assessment, including systematic behavioral observations, curriculum-based assessment, behavior rating scales, behavioral interviews, and self-monitoring. Includes conceptual issues in applying traditional psychometric theories to behavioral assessment data, as well as methods for integrating multimodal behavioral assessment information.

EDUC 255A Principles of Social Behavior Intervention 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in School Psychology or Special Education; or consent of instructor. Covers the principles and procedures for developing social competencies in school-age children and youth. Topics include social skills assessment, sociometric assessment, and strategies for promoting acquisition, performance, and maintenance of social skills.

EDUC 255B Principles of Academic Behavior Intervention 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in School Psychology or Special Education; or consent of instructor. Covers the principles and procedures for prevention and remediation of academic learning problems and performance. Topics include functional analysis, stimulus control, generalization, and methods for summarizing trends in academic performance.

EDUC 255C Child Behavior Therapy 4 Seminar, 3 hours; field, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in School Psychology or Special Education; graduate standing; or consent of instructor. Covers principles derived from neobehavioristic and social learning theories applied to treat children's problems. Discusses professional ethics, practice, and responsibility in clinical child behavior therapy.

EDUC 255D Advanced Child Behavior Therapy 4 Lecture, 3 hours; extra reading, 9 hours. Prerequisite(s): EDUC 255C or written consent of the instructor. Introduces advanced child behavior therapy techniques for individual, family, and group therapy. Emphasizes different evidence-based therapy approaches in school settings.

EDUC 256 Advanced Seminar in Learning Disabilities 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EDUC 212 or equivalent; graduate standing; or consent of instructor. Critical evaluation of theory and research in the field of learning disabilities. Requires a data-based project reflecting original research.

EDUC 257 Language, Culture, and Education 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines how culture and language influence educational processes and outcomes, by focusing on issues such as testing, gendered pedagogies, cultural adaptations of minority groups, social uses of literacy, Ebonics, bilingual education, and cultural capital.

EDUC 259 Research Seminar 2 Seminar, 2 hours. Prerequisite(s): first-year standing in the Ph.D. program in Education or consent of instructor. Introduces opportunities and requirements for successful graduate study. Emphasizes effective strategies for developing and implementing a program of professional development and graduate research. Involves research reports on topics in educational psychology, special education, curriculum and instruction, and/or educational administration. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

EDUC 260 History of Curriculum 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): consent of instructor. Investigates the historical construction of schooling in general and specifically the curriculum -- formal, informal, and hidden. Explores the purposes of schooling, the relation between schooling and U.S. culture, and the sociocultural contexts for changes and continuities in curriculum.

EDUC 261 School Psychological Consultation 4 Seminar, 3 hours; practicum, 3 hours. Prerequisite(s): admission to Ph.D. specialization in School Psychology or Special Education or M.Ed. emphasis in Applied Behavior Analysis; graduate standing; or consent of instructor. Covers theoretical and applied issues of consultative problem solving conducted in school settings. Addresses principles derived from behavioral systems and organizational theories and how these principles are used in an indirect service-delivery model to facilitate changes in students' behavior.

EDUC 262 Diversity, Equity, and Inclusion in K12 Schools 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): restricted to major(s) Education, School Psychology; graduate standing; or consent of instructor. Introduces historical and current issues of diversity, equity, and inclusion in K-12 schools. Focuses on improving the awareness of values, biases, and perspectives associated with various identities of diverse children and families. Focuses on developing culturally sensitive interventions through in-class exercises, videos, discussions, and experiential exercises.

EDUC 263 Social Psychology: Theories, Concepts, Applications 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Provides an advanced overview of major theories and concepts in social psychology and, to a lesser extent, their application to selected issues in school and clinical psychology. Special attention is given to the construct of social influence.

EDUC 264 History and Systems of Psychology: Implications For School Psychologists 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Describes various sub-disciplines of psychology, key issues and events in the history of the field, prominent individuals whose contributions have made a significant impact on the development of psychology, and major schools of thought within psychology, as well as issues related to the graduate-level specialty of school psychology.

EDUC 265A Beginning Practicum in School Psychology: Level 1 1 Seminar, 1 hour; practicum, 2 hours. Prerequisite(s): restricted to major(s) School Psychology; graduate standing. Focuses on orienting the school psychology student to children and the organizational structure and role of schools. Presents the roles, responsibilities, and functions of school staff, as well as displays familiarity with general and special programming, school policy, and practices. Emphasizes ethical, legal, and socio-cultural issues in psycho-educational service provision. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EDUC 265B Beginning Practicum in School Psychology: Level 2 1 Seminar, 1 hour; practicum, 2 hours. Prerequisite(s): EDUC 265A; graduate standing. Orients the school psychology student to the roles, functions, and practices of the school psychologist. Focuses on observing day-to-day activities of school psychologists and emphasizes issues around professional identity within school psychology as scientist-practitioners. Introduces the foundational cognitive and academic assessment and intervention activities conducted by school psychologists. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EDUC 265C Beginning Practicum in School Psychology: Level 3 1 Seminar, 1 hour; practicum, 2 hours. Prerequisite(s): EDUC 265B; graduate standing. Introduces the school psychology student to the role of the school psychologist as a behavioral and mental health service provider in school settings. Focuses on social, emotional, and behavioral assessment and intervention activities. Includes supervised assessment and intervention activities. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EDUC 265D Intermediate Practicum in School Psychology: Level 1 2 Seminar, 2 hours; practicum, 6 hours. Prerequisite(s): EDUC 265C; graduate standing. Expands the scope, proficiency, and independent application of technical and conceptual competencies. Revisits the ethical and legal mandates for school psychologists. Focuses on data-based decision-making, administration, and interpreting common assessment measures. Emphasizes organizing and disseminating formal and informal assessment results. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 4 units.

EDUC 265E Intermediate Practicum in School Psychology: Level 2 2 Seminar, 2 hours; practicum, 6 hours. Prerequisite(s): EDUC 265D; graduate standing. Emphasizes prevention and early intervention of school-based difficulties for students. Explores best practices in implementing tiered systems of school-based behavioral supports. Includes direct work with students or indirect work through teachers on necessary academic

and behavioral assessment and intervention. Introduces school-based decision making processes. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 4 units.

EDUC 265F Intermediate Practicum in School Psychology: Level 3 2 Seminar, 2 hours; practicum, 6 hours. Prerequisite(s): EDUC 265E; graduate standing. Focuses on integrating individual components of school-based practice. Emphasizes pre-referral intervention activities, consultation, integrated report writing, eligibility determinations, and IEP activities. Requires completion of paperwork, assessment, intervention, and individual psycho-educational evaluation components more independently. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 4 units.

EDUC 266 Language, Schooling, and Identity 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program or consent of instructor. Examines how formal and informal educative institutions use language for identity formation and how students/novices respond to those institutional practices.

EDUC 267 Introduction to Implementation Science and Practice: Reducing the Research to Practice Gap in School 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): restricted to major(s) Education; graduate standing; or consent of instructor. introduces and applies implementation science and practice to school systems. Explores core implementation science theories, models, frameworks, outcomes, measurement, and research design and methods to inform implementation practice. Concepts applicable to research and practice interests.

EDUC 268A Advanced Practicum in School Psychology: Level 1 2 Seminar, 2 hours; practicum, 10 hours. Prerequisite(s): EDUC 265F; graduate standing. Continues to build upon and solidify the skills learned from the previous practica. Engages in all aspects of school psychological practice. Helps develop higher level skills in the area of systems change. Supports internship application activities. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EDUC 268B Advanced Practicum in School Psychology: Level 2 2 Seminar, 2 hours; practicum, 10 hours. Prerequisite(s): EDUC 268A; graduate standing. Facilitates further autonomy in developing, implementing, and evaluating clinical and systems-level, classroom, group, or individual interventions. Includes operating at a more independent level and engaging in progressively more and more complex responsibilities while continuing to work within the limits of professional competence. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EDUC 268C Advanced Practicum in School Psychology: Level 3 2 Seminar, 2 hours; practicum, 10 hours. Prerequisite(s): EDUC 268B; graduate standing. Addresses functioning almost independently in day-to-day service provision activities for students, families, and systems. Provides opportunity to demonstrate independence in all aspects of professional practice appropriate for clinical or school placement. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EDUC 269 (E-Z) Topics in Education 2 or 4 Seminar, 2 or 3 hours; research, 1 or 3 hours. Prerequisite(s): graduate standing; or consent of instructor. A critical analysis of current theory and research in special areas of education. Covers a single topic not contained in a regular course. Announcement of each topic will be made when the course is offered and designated as either a 2- or 4-unit course. E. Educational Psychology; I. Education, Society, And Culture; M. Education, Policy, Analysis, And Leadership; N. Higher Education Administration And Policy; P. School Psychology; S. Special Education. Course is repeatable as content or topic changes to a maximum of 16 units.

EDUC 270 Reading Development and Intervention 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces the findings from national panels on reading development, instruction, and intervention. Topics include practical application of these findings to the development of reading intervention programs for students across grades.

EDUC 271A Language, Race, Power, and Identity 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): restricted to major(s) Education; graduate standing; or consent of instructor. An examination of language and literacy development in individuals and in society. Includes definitions of literacy; development of structural knowledge; development of communication skills; the role of language differences in the problems of learning to read and write; oral language arts; emergent literacy; and writing development. Credit is awarded for one of the following EDUC 271A or EDUC 271B.

EDUC 271B Language, Race, Power, and Identity in K12 Contexts 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): restricted to major(s) Education, Education; graduate standing; or consent of instructor. An examination of language and literacy development in individuals and in society. Includes definitions of literacy; development of structural knowledge; development of communication skills; the role of language differences in the problems of learning to read and write; oral language arts; emergent literacy; and writing development in K-12 educational contexts. Credit is awarded for one of the following EDUC 271B or EDUC 271A.

EDUC 273A Critical Pedagogy 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to major(s) Education; graduate standing; or consent of instructor. Introduction to pedagogies that interrogate inequities and promote social transformation. Surveys traditional approaches to critical pedagogy, anticolonial education, and ethnic studies. Topics include examination of theoretical approaches and practices within educational institutions and how they prevent and advance equity and justice. Credit is awarded for one of the following EDUC 273A or EDUC 273B.

EDUC 273B Critical Pedagogy in K12 Contexts 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to major(s) Education, Education; graduate standing; or consent of instructor. Introduction to pedagogies that interrogate inequities and promote social transformation in K-12 contexts. Surveys traditional approaches to critical pedagogy, anticolonial education, and ethnic studies. Topics include examination of theoretical approaches and practices within educational institutions and how they prevent and advance equity and justice. Credit is awarded for one of the following EDUC 273B or EDUC 273A.

EDUC 275A Race and Educational Inequity 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces a structural analysis of race and racism and its impact on the U.S. education system and beyond. Situates today's educational inequity in a historical perspective while encouraging a connection between research, theory, and practice. Credit is awarded for one of the following EDUC 275A or EDUC 275B.

EDUC 275B Pedagogies of Racial Justice 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Explores issues of race, racism, and racial justice in the context of K-12 schools. Pairs analyses of race and racism in K-12 schools with the power and transformative possibilities of racial justice pedagogy and practice. Credit is awarded for one of the following EDUC 275B or EDUC 275A.

EDUC 276 Diversity and Curriculum 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate or professional standing. Describes and analyzes the controversy surrounding efforts to develop curriculum that addresses diversity in U.S. society. Examines changing theoretical perspectives on multicultural education and key concepts such as race, identity, and culture. Reviews research on multicultural education.

EDUC 277 Critical Theories of Teaching and Teacher Education 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): admission to the M.A. or Ph.D. program in Education; graduate standing; or consent of instructor. Examines a range of theoretical perspectives used in studying the practice of teaching. Covers psychological, historical, anthropological, sociological, and philosophical perspectives.

EDUC 278 Critical Race Theory in Education 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces and explores the framework of Critical Race Theory. Provides guidance through a comprehensive analysis of

racism and racial justice in the K-16+ education system.

EDUC 279 Politics of School Knowledge 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines how existing power relations and conflicts among social and cultural groups shape the content of curriculum and the production of school knowledge. Topics include the ideological aspects of curriculum, textbook controversies and battles over school curriculum, and representational issues in curriculum and knowledge production.

EDUC 280 (E-Z) Foundations in Education 4 Prerequisite(s): graduate standing. For hours and prerequisites, see segment descriptions. Foundation core courses that introduce students to theory and research in education.

EDUC 280L The Learner 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Considers learning from psychological, cognitive, and social perspectives. Draws on recent research on the learning process in schools and other contexts. Emphasizes the relationship between teaching and learning.

EDUC 280M Contemporary Classroom Management Theory and Practice 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): enrolled in a teaching credential program; graduate standing; or consent of instructor. An overview of historical, theoretical, and applied knowledge and skills related to educator classroom management practices in pre K-12 school settings. Examines theory standards and practices derived from behavioral systems and organizational theories and how underlying principles guide standards of professional practice in effective indirect service delivery.

EDUC 280R Restorative Classroom Cultures 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to major(s) Education, Special Education Teaching; graduate standing; or consent of instructor. Engages in critical reflection of the harm of many punitive discipline approaches in K-12 schools. Explores a reimagination of classrooms that are founded on relationality, building a sense of belonging, and embodying a restorative classroom culture.

EDUC 281 History of Educational Policy and Reform 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate or professional standing. Introduces a historical context for understanding education policy and reform in the United States. Topics include the ideological forces that shaped the institutional context and character of American education at different periods in the nation's history and how ideas shaped the educational system by institutionalizing certain norms and values.

EDUC 282A Curriculum Theory and Instructional Processes: Mathematics and Science 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): EDUC 171 with a grade of C- or better, may be taken concurrently or EDUC 172 with a grade of C- or better, may be taken concurrently; admission to a teaching credential program; graduate standing. Introduces curriculum theory and instructional processes as they relate to mathematics and science in the multiple subject and education specialist classroom.

EDUC 282B Curriculum Theory and Instructional Processes: Social Studies, Visual and Performing Arts, and Physi 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): EDUC 171 with a grade of C- or better or EDUC 172 with a grade of C- or better; admission to a teaching credential program; graduate standing. Introduces curriculum theory and instructional processes as they relate to social studies, visual and performing arts, and physical education in the multiple subject and education specialist classroom.

EDUC 283 Analyzing the Practice of Teaching 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): restricted to major(s) Education; graduate standing; or consent of instructor. Focuses on analysis of classroom teaching and examines how curriculum and instruction influence student understanding. Introduces how to conduct comprehensive analyses of K-12 instructional practice.

EDUC 284 Theory and Research On Schooling and Social Inequality 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): admission to the Ph.D. program in Education or consent of instructor. Analyzes the social and cultural organization of schools and the relationship between schooling and social inequality. Draws upon research in sociology, anthropology, and education to examine theoretical perspectives on the relationship between schooling and social stratification, with special attention to the influence of class, race, and ethnicity on academic achievement.

EDUC 285 (E-Z) Curriculum Theory and Instructional Processes 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): EDUC 147 with a grade of C- or better; EDUC 162 with a grade of C- or better or EDUC 280L with a grade of C- or better; EDUC 132 with a grade of C- or better; EDUC 177 with a grade of C- or better, may be taken concurrently or EDUC 178 with a grade of C- or better, may be taken concurrently; admission to a teaching credential program; graduate standing; or consent of instructor. Introduces curriculum theory and instructional processes as they relate to the single subject classroom. E. Secondary Social Studies; I. Secondary English; L. Secondary Foreign Language; M. Secondary Mathematics; N. Secondary Mathematics And Science; R. Secondary Visual And Performing Arts; S. Secondary Science; T. Portraits Of Teaching.

EDUC 286 Language Development in the Content Areas in Dual Language Immersion Classrooms 4 Lecture, 3 hours; field, 2 hours; research, 1 hour. Prerequisite(s): EDUC 179A with a grade of C- or better; admission to a teaching education program; graduate standing; and consent of instructor. Explores the analysis, planning, execution, and evaluation of empirical and theoretical foundations of dual language immersion programs and instructional strategies for English and partner language development. Includes content area instruction in English and the partner language. Credit is awarded for one of the following EDUC 286 or EDUC 179B.

EDUC 287A Curriculum, Instruction, and Functional Communication For Students With Extensive Support Needs 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): admission to the Education Specialist Credential program; graduate standing; or consent of instructor. Explores the rationale and design of instructional programs for individuals with moderate to severe disabilities. Examines the support systems in place to assist students with extensive needs to become as independent and productive as possible. Examines methods to enhance verbal and non-verbal communication and how to develop fundamental social skills.

EDUC 287B Adapting Core Curriculum and Standards-Based Instruction (mild-Moderate Disabilities) 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): admission to the Education Specialist Credential program; graduate standing; or consent of instructor. Describes and analyzes the approaches, materials, and practices that enable students with mild/moderate disabilities to gain access to core curriculum and make progress toward state standards. Emphasizes research-based instructional approaches and discusses ways to support special needs students, including English learners, in mainstream classes. Examines the IEP.

EDUC 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate status and consent of instructor. Research and special studies in education. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

EDUC 291 Individual Studies in Coordinated Areas 1 to 12 Individual Study, 3 to 36 hours. Prerequisite(s): graduate standing. A program of studies designed to assist students who are preparing for graduate degree examinations that includes dissertation pre-proposal preparation and capstone projects. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

EDUC 292 Concurrent Studies in Education 1 to 4 Practicum, 3 to 12 hours. Prerequisite (s): graduate standing; consent of instructor and department. Each EDUC 292 course will be taken concurrently with some 100-series course in Education on an individual basis. It will be devoted to research, criticism, and/or written work of graduate order commensurate with the number of units elected. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

EDUC 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): advanced graduate standing and consent of instructor. Directed research on selected issues in education. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 36 units.

EDUC 298I Individual Internship 1 to 12 Internship, 2 to 24 hours; written work, 1 to 12 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Supervised internship with an approved professional individual or organization based on a written plan approved by the field supervisor and internship coordinator and/or faculty member. Includes two hours per week of direct supervision by the field supervisor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

EDUC 299 Research For Thesis Or Dissertation 1 to 12 Directed independent studies, 1-6 hours. Prerequisite(s): advancement to candidacy for the master's or doctoral degree . Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

EDUC 302 College Teaching Practicum 1 to 6 Practicum, 3 to 18 hours. Prerequisite(s): advanced Ph.D. standing and consent of instructor. A minimum of one quarter supervised teaching in college level classes under the supervision of the course instructor. Required of all doctoral candidates in the Graduate School of Education. Fulfills teaching portion of Ph.D. requirements. Graded Satisfactory (S) or No Credit (NC). May be taken for a maximum of three quarters.

EDUC 320A Integrating Technology Into Classroom Practice 1 Lecture, 8 hours per quarter; laboratory, 3 hours per quarter; field, 3 hours per quarter. Prerequisite(s): admission to a teaching credential program Introduction to technology in education. Prepares future teachers to effectively utilize computers and related technology for information management, presentations, and classroom instruction. Topics include software, the Internet, and basic operations of educational technology. Includes field observations in schools. Graded Satisfactory (S) or No Credit (NC).

EDUC 320B Integrating Technology Into Classroom Practice 1 Lecture 8 hours per quarter, laboratory 3 hours per quarter, field 3 hours per quarter, Prerequisite(s): EDUC 320A. Focuses on the application of computer technology to curriculum and instruction. Topics include Internet applications, non-computer technology, and use of technology to enhance problem solving skills. Includes field observations in schools. Graded Satisfactory (S) or No Credit (NC).

EDUC 320C Integrating Technology Into Classroom Practice 1 Lecture, 4 hours per quarter; laboratory, 15 hours per quarter; field, 3 hours per quarter. Prerequisite(s): EDUC 320A, EDUC 320B. Addresses issues related to the use of technology in schools. Using presentation software, the Internet, and other computer-based technology, students develop and teach a curriculum unit appropriate to their teaching subject area and/or grade level. Emphasis is on integrating the use of computer-based applications with instruction. Graded Satisfactory (S) or No Credit (NC).

EDUC 330 Education Specialist and Multiple Subject Seminar 2 Seminar, 20 hours per quarter. Prerequisite(s): admission to a teaching credential program; graduate standing. Analyzes instructional strategies for a combined cohort of credential candidates working with students with disabilities and multiple subject classrooms. Topics include basic curriculum, classroom management, interpersonal relationships, self-evaluation, and professional competencies.

EDUC 331 Education Specialist Credential Seminar 2 Seminar, 20 hours per quarter. Prerequisite(s): admission to a teaching credential program; graduate standing. Analyzes instructional strategies for working with students with disabilities. Topics include basic curriculum, classroom management, interpersonal relationships, self-evaluation, and professional competencies.

EDUC 332 Multiple Subject Credential Seminar 2 Seminar, 20 hours per quarter. Prerequisite(s): admission to a teaching credential program; graduate standing. Analyzes instructional processes used in multiple subject classrooms. Topics include curriculum planning, classroom management, instructional strategies, oral and written communication skills, interpersonal relationships, self-evaluation, and professional competencies.

EDUC 333 Single Subject Credential Seminar 2 Seminar, 20 hours per quarter. Prerequisite(s): admission to a teaching credential program; graduate standing. Analyzes instructional strategies for the single subject classroom. Topics include curriculum planning, classroom management, oral and written communication skills, interpersonal relationships, self-evaluation, and professional competencies.

EDUC 334 Combined Credential Seminar 2 Seminar, 20 hours per quarter. Prerequisite(s): admission to a teaching credential program; graduate standing. Analyzes instructional strategies for a combined cohort of credential candidates working with students with disabilities, multiple subject, or single subject classrooms. Topics include basic curriculum, classroom management, interpersonal relationships, self-evaluation, and professional competencies.

EDUC 336A Supervised Teaching in the Elementary School 4 Field, 160 hours per quarter. Prerequisite(s): EDUC 337A, may be taken concurrently, EDUC 344A, may be taken concurrently; admission to a teaching credential program; graduate standing. Supervised teaching in the multiple subject classroom. Required of all candidates for the Multiple Subject Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following EDUC 336A or EDUC 338A.

EDUC 336B Supervised Teaching in the Elementary School 4 Field, 160 hours per quarter. Prerequisite(s): EDUC 162 with a grade of C- or better or EDUC 280L with a grade of C- or better, EDUC 336A with a grade of S or better; concurrent enrollment in EDUC 344B; concurrent enrollment in or completion of EDUC 337B; graduate standing. Supervised teaching in the multiple subject classroom. Required of all candidates for the Multiple Subject Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following EDUC 336B or EDUC 338B.

EDUC 336C Supervised Teaching in the Elementary School 4 Field, 160 hours per quarter. Prerequisite(s): EDUC 336B with a grade of S or better; concurrent enrollment in EDUC 344C; concurrent enrollment in or completion of EDUC 337C; graduate standing. Supervised teaching in the multiple subject classroom. Required of all candidates for the Multiple Subject Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following EDUC 336C or EDUC 338C.

EDUC 337A Teaching Performance For Multiple Subject Candidates 2 Field, 40 hours per quarter; written work, 20 hours per quarter. Prerequisite(s): admission to a teaching credential program or an intern teaching program; concurrent enrollment in or completion of EDUC 336A or EDUC 338A; graduate standing. Teaching performance for California teachers. Topics include teaching performance assessment, lesson design, and classroom instruction in public schools. Fieldwork hours completed in regular placement as assigned for EDUC 336A or EDUC 338A. Required of all candidates for the Multiple Subject Credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 337B Teaching Performance For Multiple Subject Candidates 2 Field, 40 hours per quarter; written work, 20 hours per quarter. Prerequisite(s): EDUC 337A; graduate standing. Teaching performance for California teachers. Topics include teaching performance assessment, lesson design, and classroom instruction in public schools. Fieldwork hours completed in regular placement as assigned for EDUC 336B or EDUC 338B. Required of all candidates for the Multiple Subject Credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 337C Teaching Performance For Multiple Subject Candidates 2 Field, 40 hours per quarter; written work, 20 hours per quarter. Prerequisite(s): EDUC 337B; concurrent enrollment in or completion of EDUC 336C or EDUC 338C; graduate standing. Teaching performance for California teachers. Topics include teaching performance assessment, lesson design, and classroom instruction in public schools. Fieldwork hours completed in regular placement as assigned for EDUC 336C or EDUC 338C. Required of all candidates for the Multiple Subjects Credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 338A Intern Teaching in the Elementary School 8 Field, 260 hours per quarter. Prerequisite(s): EDUC 162 with a grade of C- or better, EDUC 171 with a grade of C- or better or EDUC 172 with a grade of C- or better, EDUC 179A with a grade of C- or better; concurrent enrollment in EDUC 344A; concurrent enrollment in or completion of EDUC 337A; admission to intern teaching credential program; graduate standing. Intern

teaching in the multiple subjects classroom. Required for the Multiple Subject Internship Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following EDUC 338A or EDUC 336A.

EDUC 338B Intern Teaching in the Elementary School 8 Field, 260 hours per quarter. Prerequisite(s): EDUC 338A; concurrent enrollment in EDUC 344B; concurrent enrollment in or completion of EDUC 337B; admission to intern teaching credential program; graduate standing. Intern teaching in the multiple subject classroom. Required for the Multiple Subject Internship Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following EDUC 338B or EDUC 336B.

EDUC 338C Intern Teaching in the Elementary School 8 Field, 260 hours per quarter. Prerequisite(s): EDUC 338B; concurrent enrollment in EDUC 344C; concurrent enrollment in or completion of EDUC 337C; admission to intern teaching credential program; graduate standing. Intern teaching in the multiple subject classroom. Required for the Multiple Subject Internship Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following EDUC 338C or EDUC 336C.

EDUC 344A Multiple Subjects Credential Seminar 2 Seminar, 2 hours. Prerequisite(s): concurrent enrollment in EDUC 336A or EDUC 338A or consent of instructor. Analyzes instructional processes used in multiple subjects classrooms. Topics include classroom management, curriculum planning, instructional strategies, and oral and written communication skills.

EDUC 344B Multiple Subjects Credential Seminar 2 Seminar, 2 hours. Prerequisite(s): EDUC 171 with a grade of C- or better or EDUC 172 with a grade of C- or better; EDUC 344A with a grade of C- or better; concurrent enrollment in EDUC 336B or EDUC 338B; graduate standing. Analyzes instructional processes used in multiple subjects classrooms. Topics include classroom management, curriculum planning and instructional strategies, K-12 academic standards in mathematics related to classroom curriculum and activities, and teaching language arts in the content areas.

EDUC 344C Multiple Subjects Credential Seminar 2 Seminar, 2 hours. Prerequisite(s): EDUC 344B; concurrent enrollment in EDUC 336C or EDUC 338C. Analyzes instructional processes used in multiple subjects classrooms. Topics include classroom management; curriculum planning; instructional strategies; K-12 academic standards in history and the social sciences, the visual and performing arts, health, and physical education; and teaching language arts in the content area.

EDUC 345A Supervised Student Teaching in A Special Class For Individuals With Mild/Moderate Disabilities 12 Seminar, 2 hours; field, 30 hours. Prerequisite(s): admission to an Education Specialist Credential program. Student teaching in a special education day class for individuals with mild/moderate disabilities. Required for the Education Specialist Instruction Credential in Mild/Moderate Disabilities. Graded Satisfactory (S) or No Credit (NC).

EDUC 345B Supervised Student Teaching in A Special Class For Individuals With Moderate/Severe Disabilities 12 Seminar, 2 hours; field, 30 hours. Prerequisite(s): admission to an Education Specialist Credential program. Student teaching in a special education day class for individuals with moderate/severe disabilities. Required for the Education Specialist Instruction Credential in Moderate/Severe Disabilities. Graded Satisfactory (S) or No Credit (NC).

EDUC 348A Single Subject Credential Seminar 2 Seminar, 2 hours. Prerequisite(s): EDUC 162 with a grade of C- or better, may be taken concurrently or EDUC 280L with a grade of C- or better, may be taken concurrently, EDUC 177 with a grade of C- or better, may be taken concurrently or EDUC 178 with a grade of C- or better, may be taken concurrently; concurrent enrollment in EDUC 376A or EDUC 378A; graduate standing. Analyzes instructional problems encountered by candidates in the single subject classroom. Topics include basic curriculum, classroom management, interpersonal relationships, self-evaluation, and professional competencies.

EDUC 348B Single Subject Credential Seminar 2 Seminar, 2 hours. Prerequisite(s): EDUC 348A; concurrent enrollment in EDUC 376B or EDUC 378B; graduate standing. Analyzes instructional problems encountered by candidates in the single subject classroom. Topics include basic curriculum, classroom management, interpersonal relationships, self-evaluation, and professional competencies.

EDUC 348C Single Subject Credential Seminar 2 Seminar, 2 hours. Prerequisite(s): EDUC 348B; concurrent enrollment in EDUC 378C or EDUC 378C. Analyzes instructional problems encountered by candidates in the single subject classroom. Topics include basic curriculum, classroom management, interpersonal relationships, self-evaluation, and professional competencies.

EDUC 376A Supervised Teaching in the Secondary School 4 Field, 160 hours per quarter. Prerequisite(s): EDUC 162 with a grade of C- or better, may be taken concurrently or EDUC 280L with a grade of C- or better, may be taken concurrently, EDUC 177 with a grade of C- or better, may be taken concurrently or EDUC 178 with a grade of C- or better, may be taken concurrently; concurrent enrollment in EDUC 348A and EDUC 377A; admission to a teaching credential program; graduate standing. Supervised teaching in the single subject classroom. Required of all candidates for the Single Subject Credential Candidates. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following EDUC 376A or EDUC 378A.

EDUC 376B Supervised Teaching in the Secondary School 4 Field, 160 hours per quarter. Prerequisite(s): EDUC 376A; completion of or concurrent enrollment EDUC 348B and EDUC 377B; graduate standing. Supervised teaching in the single subject classroom. Required of all candidates for the Single Subject Credential. Credit is awarded for one of the following EDUC 376B or EDUC 378B.

EDUC 376C Supervised Teaching in the Secondary School 4 Field, 160 hours per quarter. Prerequisite(s): EDUC 376B; concurrent enrollment in EDUC 348C and EDUC 377C; graduate standing. Supervised teaching in the single subject classroom. Required of all candidates for the Single Subject Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following EDUC 376C or EDUC 378C.

EDUC 377A Teaching Performance For Single Subject Candidates 2 Field, 40 hours per quarter; written work, 20 hours per quarter. Prerequisite(s): admission to a teaching credential program; concurrent enrollment in or completion of EDUC 376A or EDUC 378A; graduate standing. Teaching performance for California teachers. Topics include teaching performance assessment, lesson design, and classroom instruction in public schools. Fieldwork hours completed in regular placement as assigned for EDUC 376A or EDUC 378A. Required of all candidates for the Single Subject Credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 377B Teaching Performance For Single Subject Candidates 2 Field, 40 hours per quarter; written work, 20 hours per quarter. Prerequisite(s): concurrent enrollment in or completion of EDUC 376B or EDUC 378B; graduate standing. Teaching performance for California teachers. Topics include teaching performance assessment, lesson design, and classroom instruction in public schools. Fieldwork hours completed in regular placement as assigned for EDUC 376B or EDUC 378B. Required of all candidates for the Single Subject Credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 377C Teaching Performance For Single Subject Candidates 2 Field, 40 hours per quarter; written work, 20 hours per quarter. Prerequisite(s): concurrent enrollment in or completion of EDUC 376C or EDUC 378C; graduate standing. Teaching performance for California teachers. Topics include teaching performance assessment, lesson design, and classroom instruction in public schools. Fieldwork hours completed in regular placement as assigned for EDUC 376C or EDUC 378C. Required of all candidates for the Single Subject Credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 378A Intern Teaching in the Secondary School 8 Field, 260 hours per quarter. Prerequisite(s): EDUC 162 with a grade of C- or better or EDUC 280L with a grade of C- or better; EDUC 177 with a grade of C- or better or EDUC 178 with a grade of C- or better; EDUC 179A with a grade of C- or better; concurrent enrollment in or completion of EDUC 348A

and EDUC 377A; admission to intern teaching credential program; graduate standing. Intern teaching in the single subject classroom. Required for the Single Subject Internship Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following EDUC 378A or EDUC 376A.

EDUC 378B Intern Teaching in the Secondary School 8 Field, 260 hours per quarter. Prerequisite(s): EDUC 378A; concurrent enrollment in or completion of EDUC 348B and EDUC 377B; admission to intern teaching credential program; graduate standing. Intern teaching in the single subject classroom. Required for the Single Subject Internship Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following EDUC 378B or EDUC 376B.

EDUC 378C Intern Teaching in the Secondary School 8 Field, 260 hours per quarter. Prerequisite(s): EDUC 378B; concurrent enrollment in or completion of EDUC 348C and EDUC 377C; admission to intern teaching credential program; graduate standing. Intern teaching in the single subject classroom. Required for the Single Subject Internship Credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for one of the following EDUC 378C or EDUC 376C.

EDUC 380A Supervised Teaching For Education Specialists 4 Field, 160 hours per quarter. Prerequisite(s): EDUC 381A, may be taken concurrently, EDUC 382A, may be taken concurrently; admission to the Education Specialist Credential program; graduate standing. Supervised teaching in the education specialist classroom. Required of all candidates for the Education Specialist Credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 380B Supervised Teaching For Education Specialists 7 Field, 240 hours per quarter. Prerequisite(s): EDUC 380A, EDUC 381B, may be taken concurrently, EDUC 382B, may be taken concurrently; admission to the Education Specialist Credential program; graduate standing. Supervised teaching in the education specialist classroom. Required of all candidates for the Education Specialist Credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 380C Supervised Teaching For Education Specialists 6 Field, 212 hours per quarter. Prerequisite(s): EDUC 380B, EDUC 381C, may be taken concurrently, EDUC 382C, may be taken concurrently; admission to the Education Specialist Credential program; graduate standing. Supervised teaching in the education specialist classroom. Required of all candidates for the Education Specialist Credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 381A Education Specialist Seminar 2 Seminar, 20 hours per quarter. Prerequisite(s): EDUC 380A, may be taken concurrently; admission to the Education Specialist Credential program; graduate standing. Analyzes instructional issues and service delivery models for teaching students identified as having Mild/Moderate Support Needs or Extensive Support Needs. Reviews the skills, knowledge base, instructional approaches, classroom management techniques, and supports needed to successfully teach students with special needs.

EDUC 381B Education Specialist Seminar 2 Seminar, 20 hours per quarter. Prerequisite(s): EDUC 381A, EDUC 380B, may be taken concurrently; admission to the Education Specialist Credential program; graduate standing. Analyzes instructional issues and service delivery models for teaching students identified as having Mild/Moderate Support Needs or Extensive Support Needs. Reviews the skills, knowledge base, instructional approaches, classroom management techniques, and supports needed to successfully teach students with special needs.

EDUC 381C Education Specialist Seminar 2 Seminar, 20 hours per quarter. Prerequisite(s): EDUC 381B, EDUC 380C, may be taken concurrently; admission to the Education Specialist Credential program; graduate standing. Analyzes instructional issues and service delivery models for teaching students identified as having Mild/Moderate Support Needs or Extensive Support Needs. Reviews the skills, knowledge base, instructional approaches, classroom management techniques, and supports needed to successfully teach students with special needs.

EDUC 382A Teaching Performance For Education Specialist Candidates 2 Field, 40 hours per quarter; written work, 20 hours per quarter. Prerequisite(s): admission to the Education Specialist Credential program; concurrent enrollment in EDUC 380A; graduate standing. Teaching performance for California teachers. Topics include analyzing and evaluating student teaching performance, lesson design, classroom management, and instructional strategies with students with special needs. Fieldwork hours completed in assigned placement. Required of all candidates for the Educational Specialist Credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 382B Teaching Performance For Education Specialists 2 Field, 40 hours per quarter; written work, 20 hours per quarter. Prerequisite(s): EDUC 382A, EDUC 380B, may be taken concurrently; admission to the Education Specialist Credential program; graduate standing. Teaching performance for California teachers. Topics include analyzing and evaluating student teaching performance, lesson design, classroom management, and instructional strategies with students with special needs. Fieldwork hours completed in assigned placement. Required of all candidates for the Educational Specialist Credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 382C Teaching Performance For Education Specialists 2 Field, 40 hours per quarter; written work, 20 hours per quarter. Prerequisite(s): EDUC 382B, EDUC 380C, may be taken concurrently; admission to the Education Specialist Credential program; graduate standing. Teaching performance for California teachers. Topics include analyzing and evaluating student teaching performance, lesson design, classroom management, and instructional strategies with students with special needs. Fieldwork hours completed in assigned placement. Required of all candidates for the Educational Specialist Credential. Graded Satisfactory (S) or No Credit (NC).

Electrical and Computer Engineering

Subject abbreviation: EE
The Marlan and Rosemary Bourns College of Engineering

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Professors Emeriti

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Hyoseung Kim, Ph.D., CEN Program Director
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Hang Qiu Ph.D.
Yinglun Zhu Ph.D.

Adjunct Professor

Alexander Balandin, Ph.D., *Distinguished Professor,* P.O.E.M. Director
Jay A. Farrell, Ph.D., KA Endowed Chair

Associate Adjunct Professors

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Aleksander Khitun, Ph.D.
Guoyuan Wu, Ph.D.

Assistant Adjunct Professors

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Alfredo Martinez-Morales, Ph.D.
Hamidreza Nazaripouya, Ph.D.
Mahesh R. Neupane, Ph.D.
Samet Oymak, Ph.D.

Cooperating Faculty

Xiaoping Hu, Ph.D. (Bioengineering)
Erfan Nozari, Ph.D. (Mechanical Engineering)
Cengiz Ozkan, Ph.D. (Mechanical Engineering)
Fabio Pasqualetti, Ph.D. (Mechanical Engineering)
Luat T. Vuong, Ph.D. (Mechanical Engineering)
Ran Wei, Ph.D. (School of Public Policy)
Bryan M. Wong, Ph.D. (Chemical and Environmental Engineering)

Affiliated Emeritus

J. Keith Oddson, Ph.D. (Mathematics)

Lecturers

Hossny El-Sherief, Ph.D.
Tofigh Heidarzadeh, Ph.D.
Aleksander Khitun, Ph.D.
Matt Vaezi, Ph.D.

Major

The Department of Electrical and Computer Engineering offers B.S., M.S., and Ph.D. degrees in Electrical Engineering and with the Department of Computer Science and Engineering jointly offers B.S. and M.S. degrees in Computer Engineering. For more information on the Computer Engineering degree programs, see Computer Engineering in this catalog.

Graduates of UCR's BS degree program in Electrical Engineering will meet high professional, ethical, and societal goals as demonstrated by accomplishing, *at least one different item in each of two different categories*:

***success in post-graduation studies* as evidenced by:**

- satisfaction with the decision to further their education
- advanced courses completed or advanced degrees earned
- professional visibility (e.g. publications, presentations, patents, inventions, awards)
- professional responsibilities (e.g. professional mentoring, professional society membership and offices, reviewing and editorial work for professional journals)

***success in a chosen profession or vocation* as evidenced by:**

- career satisfaction
- promotions/raises (e.g. management leadership positions or distinguished technical positions)
- professional visibility (e.g. publications, presentations, patents, inventions, awards)
- professional responsibilities (e.g. professional registration, professional mentoring, professional society membership and offices)
- entrepreneurial activities
- consulting activities

***contributions to society and profession* as evidenced by:**

- leadership roles
- public service
- mentoring / outreach activities
- volunteer service
- establishment and maintenance of professional networks

All undergraduates in the College of Engineering must see an advisor at least annually. Visit student.engr.ucr.edu for details.

The B.S. Electrical Engineering degree program is accredited by ABET's Engineering Accreditation Commission (EAC) under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and similarly named Engineering Programs. For more details, see https://www.ece.ucr.edu/abet/vopeo/.

Undergraduate Program Focus Areas

The electrical engineering undergraduate program offers the following focus areas:

1. **Communications, Signal Processing and Networking:** Fundamental and state-of-the-art theory and applications of acquisition, processing, and transmission of digital signals and images over wire, wireless (radio frequency), fiber optics, etc. Example applications include speech processing and recognition, mobile communication using smartphones, fiber optical communication, image enhancement and compression.
2. **Control and Robotics:** Fundamental theory, design and applications of feedback control systems and autonomous robots capable of making intelligent decisions. Example applications include automotive, marine, aircraft, and satellite control systems; motion planning, control and decision making for autonomous unmanned aerial, ground, surface, and underwater vehicles; autonomous positioning and navigation; advanced robotic manufacturing; and machine vision
3. **Embedded Systems and VLSI:** Theory, design and methodologies of embedded system using microcontrollers, very large scale, nanometer integrated circuits. Example applications include smart home appliances, Internet of Things, microprocessors, analog and mixed signal circuits, RF circuits for cell phones and wireless networks, system-on-chip and wireless networks, system-on-chip.
4. **Intelligent Systems:** Foundations and applications for acquisition and analysis of multimodal data, and inference for intelligent pattern recognition, machine learning, and decision making. Examples include, learning from sensor data; pattern recognition, computer vision, and image processing; system approximation and modeling; decision-making under uncertainty; probabilistic robotics; and intelligent transportation systems.
5. **Nanotechnology, Advanced Materials, and Devices:** Synthesis and characterization of advanced materials at nanometer scale, theory, design and fabrication of electronic and optoelectronic devices. Example applications include creation of ultra-fast low-power transistors, efficient solar cells for energy generation, highdensity memory for smart phones and mobile services, and tiny devices for medical applications.
6. **Power Systems and Smart Grid:** Power electronics, AC and DC power and their conversion, electro-mechanical energy conversion, electric motors, large-scale power generation and transmission systems, long-distance transmission and distribution of electric power, design of motion control drive circuits for robotic and industrial automation systems, and other related topics.

All undergraduates in the College of Engineering must see an advisor at least annually. For details, visit student.engr.ucr.edu.

Change of Major Criteria

All students who request a change of major to Electrical Engineering must meet the following requirements:

- Be in good academic standing
- Have no less than a C- in any Math, Science and Engineering coursework
- Have a minimum 2.0 GPA in all Math, Science and Engineering required coursework
- Be able to complete major within maximum allowable units
- Complete all the courses listed below, based on the total number of units earned, prior to submitting the major change request
- UCR transfer students interested in changing to a BCOE major must have been admissible to the major at point of entry, or must satisfy transfer admission and change of major requirements before earning 120 units
- If changing in the 90-119 units category student must have the ability to complete major within 5 years of entry as aFreshmen or 3 years after entry as aTransfer student
- Students who have earned 120 or more units are not eligible for a change of major in BCOE. NOTE: AP/IB units are excluded from maximum unit calculation

Completed 0 to less than 45 units

Completion of ENGL 001A with C or better andcompletion of the following with at least 2.7 GPA in:

- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- PHYS 040A

Completed 45 to less than 90 units

Completion of ENGL 001A with C or better andcompletion of the following with at least 2.500 GPA

- C or better in CS 010A
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A

Completed 90 to less than 120 units
Completion of ENGL 001A and ENGL 001B with C or better and completion of the following with at least 2.500 GPA:

- C or better in CS 010A
- EE 030A
- EE 030LA
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A
- PHYS 040B

University Requirements
See Undergraduate Studies section.

College Requirements
See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Electrical Engineering major uses the following major requirements to satisfy the college's Natural Sciences and Mathematics breadth requirement.

1. One course in the biological sciences chosen from an approved list
2. MATH 009A
3. PHYS 040A, PHYS 040B, PHYS 040C

Major Requirements
1. **Lower-division requirements (73 units)**
   a) One course in the biological sciences chosen from an approved list
   b) CS 010A, CS 010B, CS 061
   c) EE 016
   d) EE 010, EE 020A, EE 020B, EE 030A, EE 30LA, EE 030B
   e) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B
   f) PHYS 040A, PHYS 040B, PHYS 040C
2. **Upper-division requirements (77 units)**
   a) EE 100A, EE 110A, EE 110B, EE 114, EE 116, CS 120A/EE 120A, CS 120B/EE 120B, EE 132, EE 133, EE 142, EE 175A, EE 175B
   b) ENGR 181W
   c) Twenty-four (24) units of technical electives chosen from CS 161, CS 162, CS 168/EE 168; EE 105, EE 106, EE 100B, EE 115, EE 117, EE 118, EE 123, EE 128, EE 135, EE 136, EE 137, EE 138, EE 139, EE 141, EE 144, EE 145/ME 145, EE 146, EE 147, EE 148, EE 150, EE 151, EE 152, EE 153, EE 155, EE 162, EE 165, EE 168, ENGR 160

To ensure depth, the choice of technical electives must include at least one coherent sequence of at least four (4) courses (two required courses plus two additional) in one focus area of electrical engineering, and two (2) other technical elective courses, as defined below.

- **Communications, Signal Processing and Networking.** Required courses: EE 115, EE 141. Sequence Courses: EE 100B, EE 117, EE 118, EE 146, EE 150, EE 152, ENGR 160
- **Control and Robotics.** Required Courses: EE 105, EE 144. Sequence Courses: EE 106, EE 141, EE 145/ME 145, EE 146, EE 151, EE 152, ENGR 160
- **Embedded Systems and VLSI.** Required Courses: EE 128, EE 168. Sequence Courses: EE 100B, EE 117, EE 118, EE 135, EE 141, EE 147, EE 165, CS 161, CS 162
- **Intelligent Systems.** Required Courses: EE 144, EE 146. Sequence Courses: EE 105, EE 106, EE 115, EE 128, EE 141, EE 145, EE 147, EE 150, EE 151, EE 152, ENGR 160
- **Nanotechnology, Advanced Materials, and Devices.** Required Courses: EE 136, EE 137. Sequence Courses: EE 100B, EE 117, EE 118, EE 135, EE 138, EE 139, EE 162, EE 168
- **Power Systems and Smart Grid.** Required Courses: EE 123, EE 155. Sequence Courses: EE 100B, EE 117, EE 128, EE 153, ENGR 160

Example course sequences are available through the Student Affairs Office in the College of Engineering or student.engr.ucr.edu

Graduate Program
The Department of Electrical and Computer Engineering offers programs leading to M.S. and Ph.D. degrees.

University requirements for the M.S. and Ph.D. degrees in Electrical Engineering are given in the Graduate Studies section of this catalog.

Research focus areas currently include communications, computer vision, control, detection and estimation, distributed systems, electronic materials, error-correcting codes, image processing, information theory, intelligent sensors, intelligent systems, machine learning, modeling and simulation, multimedia, advanced materials, nanostructures and nanodevices, navigation, neural networks, pattern recognition, robotics and automation, signal processing, solid-state devices and circuits, system identification, and transportation systems.

Combined B.S. + M.S. Five-Year Program
The college offers a combined B.S. + M.S. program in Electrical Engineering designed to lead to a Bachelor of Science degree as well as a Master of Science degree in five years. Applicants for this program must have a high school GPA above 3.6, a combined SAT Reasoning score above 1950 (or ACT plus Writing equivalent), complete the Entry Level Writing Requirement before matriculation, and have sufficient mathematics preparation to enroll in calculus in their first quarter as freshmen.

Students in the B.S. + M.S. program are allowed to count up to 12 units of undergraduate technical electives taken as UCR undergraduates towards the 36-unit requirements of the M.S. degree.

Interested students who are entering their junior year should check with their academic advisor for information on eligibility and other details.

Admission
All applicants for the M.S. and Ph.D. programs must submit official scores for the GRE General Test. All applicants whose native language is not English and who do not have a degree from an institution where English is the exclusive language of instruction must complete the Test of English as a Foreign Language (TOEFL) with a minimum score of 550 (paper-based), 220 (computer-based), or 90 (Internet-based).

Applicants must meet the general admission requirements of the Riverside Division of the Academic Senate and the UCR Graduate Council as set forth in the UC Riverside Graduate Student Application. In addition, **Master's Degree** Applicants should have completed a program equivalent to UCR's B.S. in Electrical Engineering or demonstrate the required knowledge and proficiency in the following subjects:

1. Mathematics, including calculus, differential equations, and complex variables
2. Circuits and electronics (equivalent of EE 100A and EE 100B)
3. Signals and systems (equivalent of EE 111, or both EE 110A and 110B)
4. Logic design, digital systems, and microcomputers (equivalent of EE 120A and 120B)
5. Control systems (equivalent of EE 132)
6. At least one major high-level programming language and associated programming techniques (equivalent of CS 010)

Students with background in other scientific fields are encouraged to apply. Applicants lacking minimum undergraduate preparation in the above areas may be admitted, but must take the appropriate undergraduate courses as approved by the Graduate Advisor. If admitted, these students must correct all deficiencies within the first year of graduate study. Courses taken for this purpose do not count towards an advanced degree.

Master of Science
The Department of Electrical and Computer Engineering offers the M.S. degree in Electrical Engineering.

General university requirements are listed in the Graduate Studies section of this catalog. Students may obtain an M.S. degree in Electrical Engineering through either Plan I (Thesis) or Plan II (Comprehensive Examination). The normative time for a student to complete the M.S. degree under both Plan I or Plan II is six quarters (two years). Students who are admitted with deficiencies may require up to three additional quarters.

Plan I (Thesis)
Students must complete 36 units of approved graduate work in Electrical Engineering and related areas such as Computer Science and Materials Science and Engineering. At least 24 of these units must be courses numbered between 200 and 279. At least 12 units must be in graduate research (courses numbered 297 or 299). Colloquium units (CS 287, EE 259, MSE 250, MSE 251) and courses numbered 291 are not counted towards the 36 unit requirement.

Students choosing Plan I must submit a master's thesis in accordance with the general requirements of the University. The thesis must be original research work, and demonstrate the student's ability to explore a research area, acquire in-depth knowledge of the chosen research topic, and make a research contribution. The thesis must be approved by a committee of at least three

faculty members. The thesis must be defended in a two-hour examination open to the public, beginning with a brief presentation by the candidate, and followed by a question-and-answer session.

Plan II (Comprehensive Examination)
Students must complete 36 units of approved graduate or upper-division undergraduate coursework in Electrical Engineering and related areas such as Computer Science and Materials Science and Engineering. At least 24 of these units must be graduate-level courses numbered between 200 and 279. To satisfy the remaining 12 units, students may use only EE courses numbered between 200 and 289 excluding colloquium units (CS 287, EE 259, MSE 250, and MSE 251), upper-division undergraduate EE courses numbered 115 and above (with the exception of EE 116, 120, and 132) and up to 8 units of Directed Studies (290). Colloquium units (CS 287, EE 259, MSE 250, and MSE 251) and courses numbered 291 and higher are not counted towards the 36-unit requirement.

In addition to the course requirements of Plan II, students must pass a comprehensive examination administered by the program.

Normative Time to Degree
Six quarters (two years)

Doctoral Degree

The Department of Electrical and Computer Engineering offers the Ph.D. degree in Electrical Engineering.

Admission
Students with backgrounds in Electrical Engineering or other related areas are encouraged to apply. An M.S. degree is not required for admission to the Ph.D. program. Under special circumstances, applicants lacking undergraduate preparation in core Electrical Engineering areas related to their field of research may be admitted, but must take the appropriate undergraduate courses to correct the deficiencies within the first year of graduate study. Courses taken for this purpose do not count towards an advanced degree.

Course Work
Students must complete at least 36 units of approved graduate coursework in Electrical Engineering and related areas such as Computer Science, Materials Science and Engineering, or other approved subject areas. Only courses numbered between 200 and 279, excluding Colloquium courses (CS 287, EE 259, MSE 250, and MSE 251), may be counted towards this requirement. With Graduate Advisor approval, graduate courses taken and completed as part of a related MS program at UCR may count towards the 36 units of coursework required for the Electrical Engineering PhD program. Students who are admitted with an M.S. degree from a different institution may use up to 16 units of equivalent courses taken during their M.S. study to count towards the requirement.

Students must complete a minimum of six quarters (two years) in residence at UCR with a GPA of 3.00 or better. Students must establish a course plan in coordination with their research advisor or the program Graduate Advisor. The course plan should lend support to the students' research area, while adding breadth to their overall program. Students may need to take considerably more than 36 units to establish breadth and depth of knowledge in their area of research.

Advancement to Candidacy
A student advances to candidacy after he/she has passed the preliminary examination and the oral qualifying examination, as described below.

Preliminary Examination
The purpose of the preliminary examination is to screen candidates for continuation in the doctoral program. The examination is administered by the graduate program committee. Students must solve problems from five courses in one of the three Exam Areas:

- signals, systems, and machine intelligence
- nano materials and devices, or
- VLSI Circuits and Systems

At least two of these five problems must be from the "basic" courses and two must be from the "advanced" courses. The fifth problem can be either from the "basic" or the "advanced" courses designated for each Exam Area. Students who did not pass at the Ph.D. level in their first trial will be given a second chance. In the second attempt, they will be required to solve problems only from courses they did not pass at the Ph.D. level in their first attempt.

Plan II M.S. candidates who took the M.S. comprehensive examination and successfully passed at the Ph.D. level are given credit for having passed the Ph.D. preliminary examination.

Oral Qualifying Examination
Students are expected to demonstrate that they have a thorough understanding of their research field, and are capable of doing cutting-edge research. For that purpose, students must choose a research topic under the guidance of their faculty major professor and orally present to a Qualifying Committee, which is appointed by the Graduate Division based on nominations from the department.

The presentation must be accompanied by an Oral Exam Report, written in proper technical English and in the style of a typical Electrical Engineering conference or journal publication. This report should clearly describe the proposed problem under study, demonstrate substantial knowledge of the topic and related issues, present the research results the student has obtained, and indicate the plans for future work. Students must demonstrate ability to carry out a program of independent advanced research and to report the results in accordance with standards observed in recognized technical journals.

The Oral Qualifying examination is closed to the public.

The student must complete this requirement in no more than two attempts. The normative time for taking the Oral Qualifying Exam is by the end of the third year.

Dissertation Examination and Defense
After advancement to candidacy, the student must form a Doctoral Dissertation Committee chaired by his or her major professor. The committee will consist of at least three senate faculty members with at least two members from the Electrical and Computer Engineering department.

When the Doctoral Dissertation Committee determines that a suitable draft of the dissertation has been presented, a dissertation examination and defense for the student is scheduled. The defense consists of a public seminar followed by questions from the committee members and the audience.

Oral Qualifying Examination
The Oral Qualifying Exam can be taken in one of the following modes: **In-Person**, **Hybrid**, and **Remote**. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination.

Students taking the exam **In-Person** are expected to present on campus with all committee members physically present.

If **Hybrid** is chosen, then some committee members/student are expected to be in person and some committee members/student attend remotely.

If **Remote** is chosen, then all committee members and the student attend the exam remotely.

Final Defense
The same rules as that of the Oral Qualifying examination.

Normative Time to Degree
12 quarters (15 quarters for students without an M.S. in Electrical Engineering)

Preparation for Careers in Teaching

All doctoral students are recommended to be employed as teaching assistants for at least three quarters during their graduate career. The department is developing special courses to aid in the learning of effective teaching methods, such as handling discussion/lab sessions and preparing and grading examinations.

Contact the Graduate Student Affairs Officer at the Department of Electrical and Computer Engineering, (951) 827-2484, or visit ece.ucr.edu for information on graduate courses.

Professional Development Requirement

All incoming M.S. and Ph.D. students must satisfactorily complete the Fall, Winter, and Spring offerings of EE 259, Colloquium in Electrical Engineering.

Additionally, students in the Ph.D. program must submit a Professional Development Report that details the students' efforts in developing their technical writing and presentation skills. This report should be submitted to and approved by the Graduate Committee, as a prerequisite for filing the Oral Qualifying Committee nomination form. Specific requirements for the Professional Development Report are determined by the Graduate Committee.

Lower-Division Courses

EEE 003 Electronics, Smartphones and Mobile Internet 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none Introduces basic concepts and understanding of electronic products, wireless communications, industrial control, and robotics that are important for citizens and leaders in the information age. Highlights examples including smartphones, mobile Internet, robots etc. as examples. Does not confer credit towards a degree in the Bourns College of Engineering.

EE 004 Nanotechnology: Science, Applications and Future 4 Lecture, 3 hours; discussion, 1 hour. Introduces concepts and understanding of nanotechnologies in electronics, energy, medicine, and environment that are important for citizens and leaders in the technology economy. Discusses applications in cancer treatments, cosmetics, nanorobots, solar energy, and environmental protection. Does not confer credit towards a degree in the Bourns College of Engineering.

EE 005 Circuits and Electronics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): PHYS 040C or PHYS 040HC; or consent of instructor. Introduction to linear circuit elements and analysis, operational amplifiers, semiconductor diodes and transistors, analog amplifiers, and digital circuits. Provides hands-on experience in designing and analyzing electronic circuits. Does not confer credit towards a degree in Electrical Engineering and in Computer Engineering.

EE 010 Introduction to Electrical Engineering 2 Lecture, 2 hours. Prerequisite(s): none. Introduces electrical engineering applications, career options, and the electrical engineering curriculum. Provides motivation and context for the mathematics and science courses that are prerequisites to most electrical engineering courses. Discusses contemporary engineering issues, social and environmental impact of engineering solutions, professional ethics, and need for life-long learning.

EE 016 Data Analysis For Engineering Applications 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010B. Covers essential algorithms and data structures, elements of numerical data processing, linear algebra, and statistical analysis. Encompasses multiple engineering areas such as sensor interfacing, signal and image processing, pattern recognition, robotics, and intelligent systems. Introduces the use of Python programming language.

EE 020A Introduction to Ordinary Differential Equations For Physical Sciences and Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005C with a grade of C- or better or MATH 007B with a grade of C- or better or MATH 009B with a grade of C- or better or MATH 09HB with a grade of C- or better; or equivalent; or consent of instructor. Introduction to ordinary differential equations; complex numbers; trigonometric, compact and exponential Fourier Series; frequency spectrum; and Laplace transform, Fourier transform, and their application to the solution of integro-differential equations as they appear in the physical sciences and engineering. Cross-listed with MATH 045. Credit is awarded for one of the following MATH 045, EE 020A, or MATH 046.

EE 020B Linear Methods For Engineering Analysis and Design Using Matlab 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010A; MATH 009A or MATH 09HA. Introduces MATLAB programming and linear methods for engineering analysis and design. Topics include formulating engineering problems as linear systems of equations; methods for finding their solutions; vector and matrix representations of signals and systems; matrices computations; and linear programming for system analysis and design. Credit is awarded for one of the following EE 020B or MATH 031.

EE 030A Fundamentals of Electric Circuits 1 3 Lecture, 3 hours. Prerequisite(s): concurrent enrollment in EE 030LA; EE 020A or MATH 045; EE 020B, may be taken concurrently; PHYS 040C, may be taken concurrently or PHYS 040HC, may be taken concurrently. Covers Ohm's law and Kirchhoff's laws; nodal and mesh analysis; network theorems; properties of capacitors and inductors; transient analysis of RC, RL, and RLC circuits; and modeling of electric circuits with Spice.

EE 030B Fundamentals of Electric Circuits 2 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 030A, EE 030LA. Covers steady-state analysis of electric circuits using phasors and Laplace transform. Discusses Fourier series, frequency response, Bode plots, and passive filters. Also includes current-voltage characteristics and small-signal approximations of non-linear devices such as diodes, bipolar-junction transistors, and field-effect transistors. Addresses modeling of electric circuits with Spice.

EE 030LA Fundamentals of Elec Circuits I Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in EE 030A; EE 020A or MATH 045; EE 020B, may be taken concurrently; PHYS 040C, may be taken concurrently or PHYS 040HC, may be taken concurrently. Provides laboratory experiments tied to the lecture material of EE 030A. Covers resistive circuits, network theorems, operational amplifiers, and transient response. Includes application of SPICE to circuit analysis.

Upper-Division Courses

EE 100A Electronic Circuits 1 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 030B. Topics include small-signal modeling of electronic circuits; DC biasing of small-signal bipolar and field-effect transistor amplifiers; current mirrors, cascodes, differential amplifiers, and multistage amplifiers; analysis and design of negative feedback circuits; and modeling of electronic circuits with Spice.

EE 100B Electronic Circuits 2 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 100A. Covers analysis and design of advanced electronic circuits. Includes active filters; output stages and power amplifiers; comparator and timer circuits; signal and function generators; complementary metal-oxide system logic circuit implementation; signal conditioning circuits; logic interfacing; optoelectronics devices; digital-to-analog and analog-to-digital converters; non-linear circuits; and modeling of electronic circuits with Spice.

EE 105 Modeling and Simulation of Dynamic Systems 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 020A or MATH 045; EE 020B or MATH 031; EE 030A. Introduces the mathematical modeling of dynamical systems and their methods of solution. Explores advanced techniques and concepts for analytical modeling and study of various electrical, electronic, and electromechanical systems based upon physical laws. Emphasizes formulation of problems via differential equations. Addresses numerical methods for integration and matrix analysis problems.

EE 106 Programming Practical Robots 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MATH 031 or EE 020B or ME 018B; EE 016 or CS 010B or ME 118; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Covers principles for simulating, programming, and deploying robots using modern robotics middleware. Includes reading/writing of robot programs; simulating robotic systems; interfacing robot sensors and actuators; and implementing introductory motion control algorithms. Teaches contemporary robotics open-source software (ROS, Gazebo), 3D environment creation, and sensor data processing libraries (OpenCV, OpenNI, PCL).

EE 110A Signals and Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 020A or MATH 045; EE 020B or MATH 031. Covers basic signals and types of systems, linear time-invariant (LTI) systems, Fourier analysis, frequency response, and Laplace transforms for LTI systems. Includes laboratory experiments with signals, transforms, harmonic generation, linear digital filtering, and sampling/aliasing.

EE 110B Signals and Systems 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 110A. Fourier analysis for discrete-time signals and systems, filtering, modulation, sampling and interpolation, z-transforms. Laboratory experiments with signals, transforms, harmonic generation, linear digital filtering, and sampling/aliasing.

EE 111 Digital and Analog Signals and Systems 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 020A or MATH 045; EE 020B or MATH 031; or consent of instructor. Covers continuous- and discrete-time signals and systems; linear time-invariant (LTI) systems; impulse response; Fourier analysis; frequency response; Laplace and Z-transforms; and sampling theorem and Nyquist rates. Includes laboratory experiments with signals, transforms, linear digital filtering, and sampling/aliasing.

EE 114 Probability, Random Variables, and Random Processes in Electrical Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 110A, may be taken concurrently or EE 111, may be taken concurrently. Covers fundamentals of probability theory, random variables, and random processes with applications to electrical and computer engineering. Includes probability theory, random variables, densities, functions of random variables, expectations and moments, and multivariate distributions. Also addresses random processes, autocorrelation function, spectral analysis of random signals, and linear systems with random inputs.

EE 115 Introduction to Communication Systems 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 110A or EE 111. Covers spectral density and correlation, modulation theory, amplitude, frequency, phase and analog pulse modulation and demodulation techniques, signal-to-noise ratios, and system performance calculations. Laboratory experiments involve techniques of modulation and demodulation.

EE 116 Engineering Electromagnetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 030B, may be taken concurrently. Transmission lines, fields and field operators, electrostatic and magnetostatic fields, time-varying fields, electrodynamics, electromagnetic waves, plane waves, guided waves, and applications to engineering problems.

EE 117 Electromagnetics 2 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 116. Covers applications of Maxwell's equations. Includes skin effect, boundary-value problems, plane waves in lossy media, transverse EM waves, hollow metal waveguides, cavity resonators, microstrips, propagation in dielectrics and optical fibers, optical fibers applications, radiation, and antennas. Covers theoretical and computer modeling exercises in basic electromagnetic technology.

EE 118 Radio Frequency Circuit Design 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 100A, may be taken concurrently; EE 116, may be taken concurrently. Studies design and analysis of radio frequency (RF) circuits. Topics include multiport networks; scattering matrix and S-parameters; transmission lines; matching networks; Smith Chart; RF electromagnetic analysis of waveguides, antennas, filters, and couplers; RF transistor equivalent modeling; low-noise amplifier design; noise figure; oscillators and mixers; and phase lock loop. Credit is awarded for one of the following EE 118 or EE 282B.

EE 120A Logic Design 5 Lecture, 3 hours; laboratory, 3 hours; individual study, 3 hours. Prerequisite(s): CS 061 with a grade of C- or better. Covers design of digital systems. Includes Boolean algebra; combinational and sequential logic design; design and use of arithmetic logic units, carry-lookahead adders, multiplexors, decoders, comparators, multipliers, flip-flops, registers, and simple memories; state-machine design; and basic register-transfer level design. Uses hardware description languages, synthesis tools, programmable logic, and significant hardware prototyping. Cross-listed with CS 120A.

EE 120B Introduction to Embedded Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010C with a grade of C- or better or EE 016 with a grade of C- or better; CS 120A with a grade of C- or better or EE 120A with a grade of C- or better. Introduction to hardware and software design of digital computing systems embedded in electronic devices (e.g., digital cameras or portable video games). Includes embedded processor programming, standard peripherals, interfacing, and hardware/software tradeoffs. Involves use of microcontrollers and developing working embedded systems. Cross-listed with CS 120B.

EE 123 Power Electronics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 030B; UCR undergraduate majors for summer only; For MSOL EE 123 online sections: enrollment in the Online Master of Science in Engineering. Covers the study of power semiconductor devices. Includes magnetic circuits and components; switch mode converters and power supplies; and single, three-phase, pulse width modulation, and resonant pulse inverters. Addresses voltage controllers; direct current and induction motor drives; and design of motion control drive circuits for robotic and industrial automation systems. Credit is awarded for one of the following EE 123 or EE 286C.

EE 128 Sensing and Actuation For Embedded Systems 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 005, may be taken concurrently or EE 030B, may be taken concurrently; EE 120B, may be taken concurrently or CS 120B, may be taken concurrently; or consent of instructor. Covers embedded system design for sensor data acquisition, signal processing, control, and actuation. Explores sensor and motor interface principles (analog-to-digital and digital-to-analog conversion, Nyquist sampling rate, power constraints, and communication with peripherals). Also addresses design principles for instrumentation, embedded software programming, and real-time systems for sensing and control tasks.

EE 131 Edge Computing 4 Lecture, 3 hours; laboratory, 2 hours; individual study, 1 hour. Prerequisite(s): CS 100 or EE 120B or CS 120B. Covers industry standards for quality of service and security while leveraging performance constraints. Develops skill in deploying real-world applications using embedded artificial intelligence. Cross-listed with CS 131.

EE 132 Automatic Control 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 110A or EE 111; or equivalent; or consent of instructor. Covers mathematical modeling of linear systems for time and frequency domain analysis. Topics include transfer function and state variable representations for analyzing stability, controllability, and observability; and closed-loop control design techniques by Bode, Nyquist, and root-locus methods. Laboratories involve both simulation and hardware exercises. Credit is awarded for one of the following EE 132 or ME 121.

EE 133 Solid-State Electronics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 005 or EE 030B. Presents the fundamentals of solid-state electronics. Topics include electronic band structure; Fermi and quasi-Fermi levels; doping; contacts; junctions; field-effect, bipolar, and metal-oxide-semiconductor (MOS) transistors; and charge-coupled devices. Also reviews device fabrication concepts.

EE 134 Digital Integrated Circuit Design 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 100A; EE 120A or CS 120A; restricted to class level standing of junior, senior, masters, phd not advanced to candidacy, or phd advanced to candidacy; or consent of instructor. Covers transistor-level analysis and design of digital integrated circuits. Includes modern transistor devices and digital integrated circuits; in-depth analysis of inverters and logic gates; static and dynamic logic; power analysis of digital integrated circuits; sequential and memory circuits. Uses computer modeling tools to analyze digital integrated circuits.

EE 135 Analog Integrated Circuit Layout and Design 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 100A; or consent of instructor. Covers analog circuit design, layout, and verification of complementary metal oxide semiconductors (CMOSs) with use of computer-aided design tools. Topics covered include analog metal oxide semiconductor field effect transistor (MOSFET) models, current sources, references, amplified design, nonlinear analog circuits, dynamic analog circuits, analog-to-digital converters (ADCs), and digital-to-analog converters (DACs). Credit is awarded for one of the following EE 135 or EE 282C.

EE 136 Semiconductor Device Processing 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 133; or equivalent. Presents device simulations and hands-on experience in integrated-circuit fabrication techniques and device characterization. Uses four-mask metal-oxide semiconductor (MOS) technology to fabricate resistors, junctions, capacitors, and MOS transistors as well as to perform electrical evaluation. Credit is awarded for one of the following EE 136 or EE 285A.

EE 137 Introduction to Semiconductor Optoelectronic Devices 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 133. An introduction to semiconductor optoelectronic devices for optoelectronic communications and signal processing. Topics include basic optical processes in semiconductors, semiconductor light-emitting diode, semiconductor heterojunction lasers, photodetectors, solar cells, optoelectronic modulation, and switching devices. Credit is awarded for one of the following EE 137 or EE 285B.

EE 138 Electrical Properties of Materials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 040C or PHYS 04HC; or equivalent; restricted to class level

standing of junior, or senior. Introduces the electrical properties of materials. Includes the electron as a particle and a wave; hydrogen atom and the periodic table; chemical bonds; free-electron theory of metals; band theory of solids; semiconductors and dielectrics; measurements of material properties; and growth and preparation of semiconductors. Credit is awarded for one of the following EE 138 or EE 285C.

EE 139 Magnetic Materials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 040C or PHYS 040HC; or equivalent; restricted to class level standing of junior, or senior. Introduces fundamentals of magnetic materials for the next-generation magnetic, nanomagnetic, and spintronics-related technologies. Includes basics of magnetism, models of the equivalent magnetic charge and current, paramagnetic and diamagnetic materials, soft and hard magnetic materials, equivalent magnetic circuits, and magnetic system design foundations. Credit is awarded for one of the following EE 139 or EE 285D.

EE 140 Foundations and Applications of Intelligent and Autonomous Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 114 or STAT 155; or equivalent. Explores intelligent systems which make decisions based on analysis of uncertain sensed data while interacting with the physical world. Focuses on foundational principles for modeling such uncertainty to enable the design of optimal decision-making algorithms. Includes sensor data processing projects.

EE 141 Digital Signal Processing 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 110B or EE 111. Transform analysis of Linear Time-Invariant (LTI) systems; discrete Fourier Transform (DFT) and its computation; Fourier analysis of signals using the DFT; filter design techniques; and structures for discrete-time systems. Laboratory experiments on DFT, fast Fourier transforms (FFT), infinite impulse response (IIR), finite impulse response (FIR) filter design, and quantization effects.

EE 142 Introduction to Machine Learning and Data Mining 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A; MATH 031 or EE 020B; STAT 155 or EE 114 or STAT 156A; CS 100 or EE 016. Introduces formalisms and methods in data mining and machine learning. Topics include data representation, supervised learning, and classification. Covers regression and clustering. Also covers rule learning, function approximation, and margin-based methods. Cross-listed with CS 171.

EE 144 Foundations of Robotics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 020B or MATH 031 or ME 018B; EE 016 or CS 010B or ME 118; EE 106 or CS 141 or ME 120; restricted to class level standing of junior, or senior; or consent of instructor. Provides foundational knowledge on analysis, control, and programming of robots. Considers configuration space; rigid body motion; forward, inverse, and velocity kinematics; dynamics; trajectory planning; robot motion control; localization and mapping; and robot ethics. Integrates hands-on labs to program robots in simulation and experimentally by reading and interpreting sensor data. Cross-listed with ME 144. Credit is awarded for one of the following EE 144, ME 144, or EE 283A.

EE 145 Robotic Planning and Kinematics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ME 120 or equivalent; or consent on instructor. Motion planning and kinematics topics with an emphasis in geometric reasoning, programming, and matrix computations. Motion planning includes configuration spaces, sensor-based planning, decomposition and sampling methods, and advanced planning algorithms. Kinematics includes reference frames, rotations and displacements, and kinematic motion models. Cross-listed with ME 145.

EE 146 Computer Vision 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): restricted to class level standing of senior; restricted to major(s) Computer Engineering, Computer Science, Electrical Engineering; or consent of instructor. Covers imaging formation, early vision processing, boundary detection, region growing, two-dimensional and three-dimensional object representation, and recognition techniques. Credit is awarded for one of the following EE 146 or EE 284B.

EE 147 Graphics Processing Unit Computing and Programming 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 120B or CS 120B. Introduces principles and practices of programming graphics processing units (GPUs) using the parallel programming environment. Covers memory/threading models, common data-parallel programming patterns and libraries needed to develop high-performance parallel computing applications. Examines computational thinking; a broader range of parallel execution models; and parallel programming principles. Cross-listed with CS 147.

EE 148 Artificial Intelligence For Robotics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MATH 031 or EE 020B or ME 0188; EE 016 or CS 100; restricted to class level standing of junior, senior, or masters; or consent of instructor. Covers essential aspects of intelligent robot behavior focusing on reactive, deliberative, and interactive capabilities for safe, efficient interactions with environments, other robots, and humans. Discusses planning, actions, knowledge representation, perception-action feedback loops, decision-making under uncertainty, task and motion planning, robot learning, and ethical considerations in autonomous robot design. Cross-listed with CS 148.

EE 150 Digital Communications 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 114, EE 115. Topics include modulation, probability and random variables, correlation and power spectra, information theory, errors of transmission, equalization and coding methods, shift and phase keying, and a comparison of digital communication systems. Credit is awarded for one of the following EE 150 or EE 281A.

EE 151 Introduction to Digital Control 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 132; EE 141. Reviews continuous-time control systems, Z-transform and properties, sampled-data systems, stability analysis and criteria, and frequency domain analysis and design. Addresses transient and steady-state response, state-space techniques, controllability and observability, pole placement, observer design, and Lyapunov stability analysis. Laboratory experiments complementary to these topics include simulations and hardware design. Credit is awarded for one of the following EE 151 or EE 283B.

EE 152 Image Processing 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 110B or EE 111; or consent of instructor. Covers digital image acquisition, image enhancement and restoration, image compression, and computer implementation and testing of image processing techniques. Provides hands-on experience of complete image processing systems, including image acquisition, processing, and display. Credit is awarded for one of the following EE 152 or EE 281B.

EE 153 Electric Drives 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 116; or consent of instructor for graduate students. For EE 153 online section: enrollment in the Online-Master-in-Science in Engineering program. Topics include the study of electro-mechanical energy conversion, magnetic circuits, and magnetic components. Also explores linear motors, direct-current motors, induction motors, reluctance motors, and synchronous motor drives. Addresses space vectors in alternating current machines and the analysis and design of feedback controllers. Credit is awarded for one of the following EE 153 or EE 286B.

EE 155 Power System Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 030B; EE 116; or consent of instructor; EE 155 online section: enrollment in the Online Master-in-Science in Engineering program. Covers long-distance transmission of electric power. Emphasizes admittance and impedance modeling of components and systems; optimal power flow calculations and applications; symmetrical and asymmetrical fault calculations; economic operation of large-scale generation and transmission systems; and analysis of transmission and distribution networks. Credit is awarded for one of the following EE 155 or EE 286A.

EE 161 Analytical Materials Characterization 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MSE 160. Analysis of the surfaces of materials via ion, electron, and photon spectroscopies. Covers Rutherford back scattering; secondary ion mass spectroscopy; electron energy loss spectroscopy; Auger electron spectroscopy; X-ray photoelectron spectroscopy; photoluminescence; extended X-ray absorption fine structure; Fourier transform infrared spectroscopy; Raman spectroscopy; sputtering; high-vacuum generation; and focused ion beam milling. Cross-listed with MSE 161.

EE 162 Introduction to Nanoelectronics 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): EE 133; or consent of instructor; familiarity with MATLAB

or equivalent and with basic matrix algebra is recommended. Presents the basic concepts of nanoelectronics focusing on current flow through nanostructured devices. Topics include new paradigms of nanoelectronics, an atomistic view of electrical resistance, Schroedinger's equation, Coulomb blockade, basis functions, bandstructure, quantum capacitance, level broadening, and coherent transport. Credit is awarded for one of the following EE 162 or EE 285E.

EE 165 Design For Reliability of Integrated Circuits and Systems 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 100A; restricted to class level standing of senior; or graduate standing; or consent of instructor. Covers essentials of electrical transient induced failures to integrated circuits (IC) and systems. Addresses basics for different failure and testing models including electrostatic discharge (ESD). Discusses design-for-reliability (DFR) techniques such as ESD protection designs at IC, module, and system levels. Enhances learning with computer aided design (CAD) laboratories. Credit is awarded for one of the following EE 165 or EE 282D.

EE 168 Introduction to Very Large Scale Integration Design 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 120A or EE 120A; or consent of instructor. Studies integrated circuit fabrication, device characterization, and circuit simulation. Introduces basic device physics and physical design rules, MOS logic design, and timing and clock schemes. Covers layout generation, subsystem designs, and circuits for alternative logic styles. Also covers design and simulation using hardware description language and CAD tools. Cross-listed with CS 168. Credit is awarded for one of the following EE 168, CS 168, or EE 282A.

EE 175A Senior Design Project 4 Lecture, 1 hour; laboratory, 3 hours; practicum, 6 hours. Prerequisite(s): CS 010C or EE 016; CS 120B or EE 120B; restricted to class level standing of senior; restricted to major(s) Computer Engineering, Computer Engineering BS + MS, Electrical Engineering, Electrical Engineering BS + MS; or consent of instructor. Proposal of design of electrical engineering devices or systems under the direction of the instructor. Develops technical specification; considers design constraints and industry standards; emphasizes ethical responsibilities; and promotes staying current on technology and its socioeconomic and environmental impact. Graded In Progress (IP) until EE 175A and EE 175B are completed, at which time, a final letter grade is assigned.

EE 175B Senior Design Project 4 Lecture, 1 hour; laboratory, 3 hours; practicum, 6 hours. Prerequisite(s): EE 175A; senior standing in Electrical Engineering. Builds, tests, and redesigns electrical engineering devices or systems. Develops and carries out test plan according to design specification. Presents a demo of the design. Completes project testing and technical documentation. Presents a demo of the design. Satisfactory (S) or No Credit (NC) grading is not available.

EE 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): consent of instructor and department chair. Individual study to meet special curricular needs. Course is repeatable to a maximum of 9 units.

EE 191 (E-Z) Seminar in Electrical Engineering 1 to 4 Seminar, 2 to 8 hours. Prerequisite(s): EE 030B; restricted to class level standing of junior, or senior. Considers current topics in electrical engineering. Offered in Summer only.

EE 191E Electric Vehicles 1 Seminar, 2 hours. Prerequisite(s): EE 030B; restricted to class level standing of junior, or senior. Covers principles of electric vehicle design. Focuses on the principles of electric machine operation including electromechanical energy conversion, rotating machines, direct current (DC) machines, generators, alternate current (AC) machines, and dynamics and control of electric machines. Additional topics include battery technology and vehicle dynamics. Offered in Summer only.

EE 194 Independent Reading 1 to 2 Extra Reading, 3 to 6 hours. Prerequisite(s): upper division standing or consent of instructor. Independent reading in material not covered in course work. Normally taken in senior year. course is repeatable to a maximum of 4 units.

EE 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): consent of instructor and Electrical Engineering undergraduate program advisor. Directed research on a topic relevant to electrical engineering. Requires a final written report. Course is repeatable to a maximum of 8 units.

EE 198I Individual Internship in Electrical Engineering 1 to 12 Internship, 2 to 24 hours; written work, 1 to 12 hours. Prerequisite(s): upper-division standing; at least 12 units in Electrical Engineering. Provides the undergraduate student with career experience as an electrical engineer in an industry or a research unit under the joint supervision of an off-campus sponsor and a faculty member in Electrical Engineering. Each individual program must have the prior approval of both supervisors. Requires a final report. Graded Satisfactory (S) or No Credit (NC). Course is

repeatable to a maximum of 12 units.

Graduate Courses

EE 201 Applied Quantum Mechanics 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): MATH 046, PHYS 040A; graduate standing; or consent of instructor. Covers topics in quantum mechanics including Schroedinger equation; operator formalism; harmonic oscillator; quantum wells; spin, bosons, and fermions; solids; perturbation theory; Wentzel-Kramers-Brillouin approximation; tunneling; tight-binding model; quantum measurements; quantum cryptography; and quantum computing. Cross-listed with MSE 207.

EE 202 Fundamentals of Semiconductors and Nanostructures 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 133, EE 201/MSE 207; graduate standing; or consent of instructor. Examines principles of semiconductor materials and nanostructures. Topics include periodic structures, electron and phonon transport, defects, optical properties, and radiative recombination. Also covers absorption and emission of radiation in nanostructures and nonlinear optics effects. Emphasizes properties of semiconductor superlattices, quantum wells, wires, and dots. Cross-listed with MSE 217.

EE 203 Solid-State Devices 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 133 or consent of instructor. Covers electronic devices including p-n junctions, field-effect transistors, heterojunction bipolar transistors, and nanostructure devices. Explores electrical and optical properties of semiconductor heterostructures, superlattices, quantum wires, and dots, as well as devices based on these structures. Cross-listed with MSE 237C.

EE 204 Advanced Electromagnetics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 117; graduate standing; or consent of instructor. Presents selected topics in electromagnetic theory and antenna design. Topics include power transmission and attenuation in microstrip transmission lines (TL) and waveguides (WG); transient analysis and applications of TL and WG; radiation of electromagnetic waves; antenna design; electromagnetic interference and compatibility; and numerical methods in electromagnetic theory.

EE 205 Optoelectronics and Photonic Devices 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 203 or MSE 237C, EE 204; graduate standing; or consent of instructor. A study of the physical optical and photonic devices and their use in an optical communication system. Covers silica fibers, light-emitting diodes (LEDs), heterojunction lasers, p-i-n photodiodes, and avalanche photodiodes.

EE 206 Nanoscale Characterization Techniques 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 201 or MSE 207; graduate standing; or consent of instructor. An in-depth study of nanoscale materials and device characterization techniques. Emphasizes atomic force microscopy (AFM) and scanning tunneling microscopy (STM). Includes semiconductor fabrication fundamentals; metrology requirements; in situ monitoring; interconnects and failure analysis; principles of AFM, STM, and scanning electron microscopy; X-ray methods; optical and infrared techniques; and electrical characterization. Cross-listed with MSE 227A.

EE 208 Semiconductor Electronic and Optical Properties 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 221B, may be taken concurrently or EE 202, may be taken concurrently or MSE 217, may be taken concurrently; graduate standing. Introduction to electronic bandstructure. Topics include electronic structure of semiconductors,

graphene, localized orbital models, k dot p models, spin-orbit coupling, and optical generation of spin. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 227B.

EE 209 Semiclassical Electron Transport 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 201 or MSE 207; EE 203 or MSE 237C; EE 208; graduate standing. Covers the Boltzmann transport equation as applied to semiconductor device modeling. Topics include the physics of carrier scattering in common semiconductors, theoretical treatments of low and high field transport, balance equations, and Monte Carlo solutions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 210 Advanced Digital Signal Processing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 110B, EE 141; graduate standing. Provides in-depth coverage of advanced techniques for digital filter and power spectral estimation. Topics include digital filter design, discrete random signals, finite-word length effects, nonparametric and parametric power spectrum estimation, multirate digital signal processing, least square methods of digital filter design, and digital filter applications.

EE 211 Adaptive Signal Processing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 215; graduate standing. Provides an in-depth understanding of adaptive signal processing techniques. Covers Wold decomposition; Yule-Walker equations; spectrum estimation; Weiner filters; linear prediction; Kalman filtering; time-varying system tracking; nonlinear adaptive filtering; and performance analysis of adaptive algorithms and their variations including stochastic gradient, least mean square, least squares, and recursive least squares.

EE 212 Quantum Electron Transport 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 208 or MSE 227B; graduate standing; or consent of instructor. Covers the theory and methods used to model quantum electron transport in ultrascaled traditional semiconductor devices such as transistors, nanoscaled research semiconductor devices (such as quantum dots), and novel electronic material systems (such as carbon nanotubes and molecular wires.) May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 212.

EE 213 Computer-Aided Electronic Circuit Simulation 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 030A, EE 030B, EE 133; graduate standing. Introduction to numerical algorithms and computer-aided techniques for the simulation of electronic circuits. Covers theoretical and practical aspects of important analyses; circuit formulation methods; large-signal nonlinear direct current, small-signal alternating current, and moment-matching transient; sensitivity; and noise. Discusses recent advances in timing analysis, symbolic analysis, and radio frequency circuit analysis.

EE 214 Quantum Computing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 201/MSE 207 or equivalent; graduate standing or consent of instructor. An introduction to quantum computing. Topics include qubits, entanglement, quantum gates, quantum circuit diagrams, simple quantum algorithms, quantum teleportation, quantum cryptography, Shor's factorization algorithm, Grover's search algorithm, and quantum error correction. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with PHYS 220.

EE 215 Stochastic Processes 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. A study of probability and stochastic processes. Topics include discrete and continuous random variables; probability densities; characteristic functions; convergence of random sequences; central limit theorem; autocorrelation functions and spectral densities; wide-sense and strict-sense stationarity; Markov chains and processes; and response of linear time-invariant systems to random signals.

EE 216 Nanoscale Phonon Engineering 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 202 or MSE 217; graduate standing. Studies acoustic and optical phonons that affect electrical, thermal, and optical properties of materials. Focuses on the confinement-induced changes of phonon properties in nanostructures and their implications for performance of electronic, thermoelectric, and optoelectronic devices. Explores phonon theory, Raman spectroscopy and other phonon characterization techniques, thermal conductivity, and related measurements. Cross-listed with MSE 237B.

EE 217 Graphics Processing Unit Architecture and Parallel Programming 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 160 with a grade of "C-" or better; graduate standing; or consent of instructor. Introduces the popular CUDA based parallel programming environments based on Nvidia GPUs. Covers the basic CUDA memory/threading models. Also covers the common data-parallel programming patterns needed to develop a high-performance parallel computing applications. Examines computational thinking; a broader range of parallel execution models; and parallel programming principles. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 217.

EE 218 Power System Steady State and Market Analysis 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): EE 155; EE 132; ENGR 160 or EE 231. EE 218 online section; enrollment in the Online Master-in-Science in Engineering program. Introduces power system steady state and market analysis. Topics include system security criteria and security assessment; state estimation; automatic generation control; contingency screening and security constrained optimal power flow; the electricity market structure; security constrained economic dispatch and unit commitment; financial transmission rights; forward markets; and market power. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 219 Advanced Complementary Metal Oxide Semiconductor (cmos) Technology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 203/MSE 237C; graduate standing. Introduces advanced complementary metal oxide semiconductor (CMOS) technology. Topics include MOS field effect transistor (MOSFET) scaling; short and narrow channel effects; high field effects; vertical MOSFET transistors; single electron transistors; MOSFET nonvolatile memory devices; and small- and large-signal MOSFET models. Covers CMOS process integration. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 220A Quantum Magnetism 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduces fundamental physical properties of magnetism and quantum behavior of magnetic materials for the understanding of modern magnetic devices. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 237A.

EE 220B Advanced Spintronics and Nanomagnetic Devices 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 220A; graduate standing; or consent of instructor. Explores recent developments in spintronics, magnetism, and magnetic materials. Introduces magnetic devices widely used in real applications and a variety of emerging device concepts under active research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 221 Radio-Frequency Integrated Circuit Design 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 100B; senior or graduate standing. Covers the essentials of contemporary radio frequency (RF) complimentary metal oxide semiconductor (CMOS) integrated circuit (IC) analysis and design. Addresses typical RF building blocks in CMOS and bipolar/CMOS (BiCMOS) technologies, including passive IC components, transistors, distributed networks, voltage reference and biasing circuits, power amplifiers, and feedback networks. Also covers RF device modeling, bandwidth estimation, and stability analysis techniques.

EE 222 Advanced Radio-Frequency Integrated Circuit Design 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 100B; senior or graduate standing. Covers analysis techniques for nonlinear effects and noise in RF integrated circuit design. Addresses nonlinear, and distortion behavior, including inter-modulation, cross-modulation, harmonics, gain compression, and desensitization. Also explores noise effects, including thermal, short, flicker, and burst noises. Includes single-stage and multiple-stage networks.

EE 223 Numerical Analysis of Electromagnetic Devices 4 Lecture, 4 hours. Prerequisite(s): EE 117, MATH 151C; graduate standing. Covers in depth the numerical and mathematical foundations of the contemporary computer modeling techniques used in the design and analysis of electromagnetic devices and systems. Provides hands-on experience in modeling systems such as radio frequency devices, magnetic systems, and electromagnetic motors.

EE 224 Digital Communication Theory and Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 115; graduate standing; or consent of instructor. Provides overview of basic communication techniques and introduction to optimum signal detection and correction. Topics include sampling and bandwidth; pulse code modulation; line coding and pulse shaping; delta modulation; stochastic approach to bandwidth and noise corruption; white Gaussian noise; matched filter; optimum signal detection; Shannon theorems; and error correction. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 225 Error-Correcting Codes 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 215; graduate standing; or consent of instructor. Provides an overview of basic error-correcting techniques used in data transmission and storage. Topics include groups and Galois fields, error-correction capability and code design of Hamming codes, cyclic codes, Bose-Chaudhuri-Hocquengem (BCH) codes, and Reed-Solomon codes. Also considers concatenated design and decoding techniques.

EE 226 Wireless Communications 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 215; graduate standing; or consent of instructor. Presents fundamental cellular concepts and new techniques in wireless communications. Topics include cellular systems and standards, frequency reuse, system capacity, channel allocation, cellular radio propagation, fading channel modeling and equalization, spread spectrum communications and other multiple access techniques, and wireless networking.

EE 227 Introduction to Reinforcement Learning 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 215 or EE 244 or CS 224 or EE 228 or CS 228 or EE 251B or CS 252B; graduate standing; or consent of instructor. This course introduces key ideas and algorithms of reinforcement learning (RL). Key topics covered include finite Markov Decision Process (MDP), dynamic programming, Monte Carlo methods, temporal-difference learning, policy gradient methods, safety-constrained RL, batch-constrained RL, multi-agent RL, multi-armed bandits, and imitation learning. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 258.

EE 228 Introduction to Deep Learning 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 224 or EE 231 or EE 236 or EE 244 or CS 171 or EE 142; graduate standing; or consent of instructor. Explores fundamentals of deep neural networks and their applications in various machine learning tasks. Includes the fundamentals of perception, approximation, neural network architectures, loss functions, and generalization. Addresses optimization methods including backpropagation, automatic differentiation, and regularization. Covers non-standard problems including auto-encoders and probabilistic models. Presents applications in machine learning/computer vision. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 228.

EE 229 Video Processing and Communication 4 Lecture, 3 hours; laboratory, 1 hours; extra reading, 2 hours. Prerequisite(s): EE 150, EE 210; graduate standing. Covers the fundamental principles and technologies in the compression and transmission of coded video streams over wired and wireless networks, including wireless network protocols, compression standards, digital signal processor architectures, network or traffic management, quality of service, rate control schemes, and error resilience.

EE 230 Mathematical Methods For Electrical Engineers 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers fundamental theoretical concepts and computational tools for Electrical Engineering graduate students. Presents material relevant to electrical engineering applications. Topics include vector spaces; partitioned, unitary, and positive definite matrices; differential calculus with matrices; matrix decompositions; linear system solution; convex optimization; the Lagrangian method; KKT conditions; and nonlinear optimization methods. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 231 Convex Optimization in Engineering Applications 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): EE 230, may be taken concurrently; graduate standing; or consent of instructor. Covers recognizing and solving convex optimization problems in engineering applications. Explores convex sets, functions, and optimization problems. Includes basics of convex analysis, least-squares, linear and quadratic programs, semidefinite programming, minimax, and other problems. Addresses optimality conditions, duality theory, theorems of alternative and applications, interior-point methods, and applications in engineering.

EE 232 Introduction to Smart Grid 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing. EE 232 online section; enrollment in the Online Master-in-Science in Engineering program. An introduction to smart power grid. Covers the basics of power systems; definition and applications of smart grid; demand response and demand side management; renewable power generation and integration; smart grid communications; wide area measurement; smart grid cyber security and privacy; and economics and market issues. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 233 Optimal Control and Estimation 4 Lecture, 4 hours; term paper, 1 hour. Prerequisite(s): ME 120, ME 121 or equivalent; or consent of instructor. Introduces optimal control and estimation with specific focus on discrete time linear systems. Topics include analysis of discrete Riccati equations; asymptotic properties of optimal controllers; optimal tracking; an introduction to Receding Horizon control; derivation of the Kalman filter; Extended Kalman Filter; and Unscented Kalman filter. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with ME 220.

EE 234 Smart Grid Sensors and Data Driven Applications 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. For EE 234 online section; enrollment in the Online Master-of-Science in Engineering program; graduate standing. Covers state-of-the-art and emerging sensor technologies; data-driven and intelligent methods for using sensor data in innovative smart grid applications; instrumentation; time-synchronization; phasor measurements; waveform measurements; smart meters; building sensors; probing; imaging; off-domain data; metadata; and data-driven techniques for applications such as asset monitoring, situational awareness, disaggregation, and power quality assessment. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 235 Linear System Theory 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): EE 132; graduate standing. Provides a review of linear algebra. Topics include the mathematical description of linear systems; the solution of state-space equations; controllability and observability; canonical and minimal realization; and state feedback, pole placement, observer design, and compensator design. Cross-listed with ME 235.

EE 236 State and Parameter Estimation Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 215 with a grade of C or better; graduate standing. Covers Fisher information, Cramer-Rao lower bound, efficiency, and sufficient statistics. Addresses minimum variance unbiased, best linear unbiased, maximum likelihood, least squares, maximum a posteriori, and mean-squared estimation. Also covers Weiner and Kalman filtering as well as applications in navigation, signal processing, machine learning, and dynamical systems. Cross-listed with ME 236.

EE 237 Nonlinear Systems and Control 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): EE 235 or ME 235; graduate standing. Explores nonlinear systems and control. Topics include nonlinear differential equations, second order nonlinear systems, equilibrium and phase portrait, limit cycle, harmonic analysis and describing function, Lyapunov stability theory, absolute stability, Popov and circle criterion, input-output stability, small gain theorem, averaging methods, and feedback linearization. Cross-listed with ME 237.

EE 238 Linear Multivariable Control 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): EE 235 or ME 235; graduate standing. Investigates multivariable feedback systems, stability, performance, uncertainty, and robustness. Topics include analysis and synthesis via matrix factorization; Q-parameterization and all stabilizing controllers; frequency domain methods; and H(insert infinity) design and structured singular value analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with ME 238.

EE 239 Optimal Control 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): EE 215, EE 235/ME 235; graduate standing. Presents the theory of stochastic optimal control systems and methods for their design and analysis. Covers principles of optimization; Lagrange's equation; linear-quadratic-Gaussian control; certainty-equivalence; the minimum principle; the Hamilton-Jacobi-Bellman equation; and the algebraic Ricatti equation. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with ME 239.

EE 240 Pattern Recognition 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 141; or consent of instructor. For the EE 240 online section; enrollment in the Online Master-in-Science in Engineering program; graduate standing. Covers basics of pattern recognition techniques. Topics include hypothesis testing, parametric classifiers, parameter estimation, nonparametric density estimation, nonparametric classifiers, feature selection, discriminant analysis, and clustering. Credit is awarded for one of the following EE 240, CS 229, or EE 242B.

EE 241 Advanced Digital Image Processing 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 152 or consent of instructor. Covers advanced topics in digital image processing. Examines image sampling and quantization, image transforms, stochastic image models, image filtering and restoration, and image data compression.

EE 242A Foundations of Machine Learning 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 100; STAT 155 or EE 114; MATH 031; For the CS 224/EE 242A online section: enrollment in the Online Master-in-Science in Engineering program; graduate standing.; graduate standing; or consent of instructor. A study of generative and discriminative approaches to machine learning. Topics include probabilistic model fitting, gradient-based loss optimization, regularization, hyper-parameters, and generalization. Includes experience with data science programming environments, data from practice, and performance metrics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 224.

EE 242B Machine Learning 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 171 or EE 142 or CS 224 or EE 242A; For the CS 229/EE 242B online section; enrollment in the Online Master-in-Science in Engineering program; graduate standing; graduate standing. A study of supervised machine learning that emphasizes discriminative methods. Covers the areas of regression and classification. Topics include linear methods, instance-based learning, neural networks, kernel machines, and additive models. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 229. Credit is awarded for one of the following CS 229, EE 242B, or EE 240.

EE 243 Advanced Computer Vision 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 146 or EE 152 or EE 142 or CS 171 or CS 224 or EE 228 or CS 228 or EE 241 or EE 244; graduate standing or consent of instructor. For the EE 243 online section: enrollment in the Online Master-of-Science in Engineering program; graduate standing; or consent of instructor. Study of advanced computer vision including classical- and learning-based approaches. Topics include feature extraction, segmentation, motion analysis and tracking, object and activity recognition, projective geometry, modeling and calibrating cameras, and three-dimensional reconstruction. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 244 Computational Learning 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores fundamental computational learning techniques. Topics include elements of learning systems, inductive learning, analytic learning, case-based learning, genetic learning, connectionist learning, reinforcement learning and integrated learning techniques, and comparison of learning paradigms and applications.

EE 245 Robot Sensing and Navigation 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 236 or ME 236; ME 120; or equivalent; graduate standing; or consent of instructor. Topics include robot navigation; description of robot sensors and their characteristics; sensor data processing; feature extraction; and matching. Also covers representations of space for mapping; map-based localization; simultaneous localization and mapping; and image-based motion estimation. Cross-listed with ME 222.

EE 246 Intelligent Transportation Systems 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; EE 115 and EE 132 are recommended. For the EE 246 online section: enrollment in the Online Master of Science in Engineering program; graduate standing. Focuses on the control, communications, and computer aspects of intelligent transportation systems. Topics include traffic flow theory fundamentals, intelligent transportation system user services, travel and traffic management, advanced vehicle safety systems, intelligent transportation system applications, architectures, standards, strategic needs assessment and deployment, and evaluation.

EE 247 Current Topics in Computer Vision and Pattern Recognition 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 243; graduate standing; or consent of instructor. Study of current topics in computer vision focused on machine learning in computer vision. Topics include machine learning approaches for image classification, segmentation, object detection, recognition, depth estimation, multi-modal analysis, and multi-sensor analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 248 Optimization For Machine Learning 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 229 or EE 231 or EE 244; graduate standing; or consent of instructor. Explores efficient optimization algorithms for machine learning. Emphasizes fundamental principles, provable guarantees, and contemporary results. Includes fundamentals of optimization (first-order methods, stochastic algorithms, accelerated schemes, non-convex optimization, regularization, and black-box optimization). Also covers connections to statistical learning (empirical risk minimization, finite-sample guarantees, and high-dimensional problems). May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 248.

EE 249 Power System Dynamics 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): EE 218 or EE 232; EE 153 or EE 155.Introduces dynamic phenomena in power systems following disturbances. Topics include synchronous machines, voltage stability, power system reliability criteria, synchronous machine modeling, power system stability criterion under classical models, and time domain simulation. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 250 Information Theory 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): EE 215. An overview of fundamental limitations imposed on communication systems. Topics include Shannon's information measures, weak and strong typicality, lossless data compression, source and channel models and Shannon's coding theorems, channel capacity and the rate-distortion function, Gaussian sources and channels, and limits of communication between multiple terminals.

EE 251A Data Analytics and Exploration 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 141, CS 100; STAT 155 or EE 114 or equivalent; graduate standing; or consent of instructor. Covers important algorithms relevant to the lifetime of data from data collection and cleaning to integration, data mining, and analytics. Topics include: sketch algorithms for computing statistics on data streams; mining social graphs including community detection and graph partitioning; Data Science life cycle: techniques on data cleaning, data integration, Exploratory Data Analysis, and visualization. Cross-listed with CS 252A.

EE 251B Fundamentals of Data Science 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): MATH 010A, MATH 031 or EE 020B; CS 100; STAT 155 or EE 114; graduate standing; or consent of instructor. Explores theoretical tools in data science and their

applications in data science. Introduces and motivates statistical and computational viewpoints on data analysis. Topics include the manipulation of data as vectors, drawing inferences from data as distributions, and quantifying data uncertainty for data analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 252B.

EE 252 Data Center Architecture 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): CS 161 or consent of instructor. Introduces recent trends and challenges of warehouse-scale computing and data center systems. Topics include virtualization, resource management, data market, power management, sustainable computing, and demand response.

EE 253 Electric Power Distribution Systems 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): EE 155, graduate standing; or consent of instructor. Covers fundamentals of the operation and planning of electric power distribution systems. Topics include electric load modeling, overhead and underground lines, three-phase transformers, voltage regulation, three-phase unbalanced power flow, three-phase optimal power flow, and system protection. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 254 Fundamentals of Lithographic Process Development 4 Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A detailed and practical discussion of lithographic process development. Topics include photolithography, mask design, extreme ultraviolet lithography, electron beam lithography, focused ion beam lithography, nanoimprint lithography, and patterning via directed self-assembly. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 255 Real-Time Embedded Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 120B or EE 120B; graduate standing. Covers fundamentals and principles of real-time embedded systems. Topics include uniprocessor and multiprocessor real-time scheduling, real-time operating systems, synchronization, resource reservation, memory management, and power management. Introduces mathematical techniques for real-time system analysis. Offers hands-on experience with designing, implementing, and evaluating real-time systems on embedded platforms. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 251.

EE 256 Superconductive Quantum Electronics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 201 or MSE 207; or equivalent; graduate standing; or consent of instructor. Studies superconductivity and superconductive electronic devices. Introduces the electrodynamics of superconducting materials, as well as unconventional superconductivity and Josephson junctions. Explores applications of superconducting quantum interference devices, superconducting digital logic, quantum bits, and high frequency THz electronics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 257 Global Navigation Satellite System Signal Processing and Receiver Design 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 215 or consent of instructor. Develops a comprehensive understanding of Global Navigation Satellite System (GNSS) signal structure, GNSS communication channel, received power, radio frequency (RF) front-end receiver design, sampling, correlation, acquisition techniques, tracking loop theory, noise and bandwidth concepts, generation of GNSS observables, and software-defined radio (SDR) implementation. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 258 Distributed Computing in Cyber-Physical Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Covers theoretical foundations of distributed computing including logical clocks, message delivery, and mutual exclusion, with applications to cyber-physical systems such as autonomous vehicles and robotics. Topics include distributed coordination, resilience, and emerging techniques like LLM-driven communication in CPS, bridging theory, and practical applications. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 256.

EE 259 Colloquium in Electrical Engineering 1 Colloquium, 1 hour. Prerequisite(s): graduate standing. Lectures on current research topics in electrical engineering relating to professional development presented by faculty members and visiting scientists. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

EE 260 Seminar in Electrical Engineering 1 to 4 Seminar, 1 to 4 hours. Prerequisite(s): consent of instructor. Seminar on current research topics in electrical engineering, including areas such as signal processing, image processing, control, robotics, intelligent systems, computer vision, and pattern recognition. Course is repeatable to a maximum of 16 units.

EE 265A Foundations of Robotics: Planning and Control 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Provides a theoretical and practical introduction to fundamental concepts used for the development of robotic systems. Covers robot kinematics; motion planning algorithms; robot motion control; and state estimation. Uses mobile robots to teach contemporary robotics software (ROS, Gazebo) that integrates the taught concepts to develop autonomous robot applications. Cross-listed with CS 265A.

EE 265B Foundations of Robotics: Sensing and Navigation 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): EE 245A; CS 224 or EE 242A; graduate standing; or consent of instructor. Covers fundamental topics for robot perception. Provides a theoretical and practical introduction to SLAM. Discusses related advanced topics on robot sensing and navigation. Teaches the mechanisms that allow autonomous robots to move through a real-world environment to perform their tasks. Cross-listed with CS 265B.

EE 266 Advanced Topics in Connected and Automated Transportation Systems 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): recommend EE 115, EE 132, and EE 246; graduate standing or consent of instructor. For the CS 266 online sections: enrollment in the Online Master-in-Science in Engineering program; graduate standing. Focuses on the emerging topics in connected and automated transportation systems (CATS). Topics include powertrain control; vehicle dynamics; cooperative automated driving in mixed traffic; personalized human-behavior modeling; vehicle-infrastructure collaborative perception and management; advanced Analysis/Modeling/Simulation platform; and cyber-security. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 267 Introduction to Autonomous Driving Systems 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 128 or EE 131 or EE 142 or EE 146 or EE 148 or EE 227 or CS 258 or EE 242A or CS 224 or CS 205 or CS 131 or CS 153 or CS 160 or CS 148; or equivalent; graduate standing; or consent of instructor. Introduces the state-of-the-art autonomous driving ecosystem from perception to prediction, localization, and planning and from onboard compute to offboard simulation. Includes mapping, remote operation, and v2x communication. Discusses foundational methods, common practices, and frontier research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 268 Trustworthy Ai For Autonomy 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 142 or EE 146 or EE 148 or CS 148 or CS 171; or equivalent; graduate standing; or consent of instructor. Introduces core principles and practices for developing safe, reliable AI in autonomous systems and robotics, covering foundational and advanced concepts in trustworthy AI and machine learning. Integrates cutting-edge research on building safe, robust, generalizable, and explainable systems, emphasizing the critical role of trust and ethics in AI deployment. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 269 Foundation Models and Advances in Ai 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 228, EE 228, EE 242A, CS 224; graduate standing; or consent of instructor. Explores key concepts in foundation models and recent advances in AI. Covers model architectures such as attention, transformers, and state space models; training pipelines including pretraining, fine-tuning, and reinforcement learning from human feedback; data acquisition strategies; tool augmentations; multimodal models; and techniques for efficient training and inference.

EE 270 Introduction to Video Bioinformatics 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to video bioinformatics. Includes microscopic techniques, live imaging, video computing, structure and function of cells, spatiotemporal dynamics, multi-scale analysis, disk and data storage, indexing and queries, image and video databases, and medical imaging and analysis techniques. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with GEN 270.

EE 272 Introduction to Imaging Bioinstrumentation and Analysis 2 Lecture, 1 hour; laboratory, 3 hours; extra reading, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the instrumentation used to collect video images of cells and the methods used to analyze video data. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with GEN 272.

EE 273 Live Imaging and Analysis of Cellular and Molecular Behaviors 2 Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): EE 272/GEN 272 or consent of instructor. An introduction to video imaging methodologies used to capture the cellular and molecular dynamics and interactions in living cells. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with GEN 273.

EE 274 Introduction to Medical Imaging and Analysis 2 Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to medical imaging. Includes associated computational techniques for x-ray imaging, computed tomography, magnetic resonance imaging, positron emission tomography, ultrasound, radiotherapy, and molecular imaging. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with GEN 274.

EE 275 Project in Video Bioinformatics 2 Lecture, 1 hour; laboratory, 4 hours. Prerequisite(s): graduate standing; consent of instructor. Explores video bioinformatics research techniques. Emphasizes critical thinking and advanced planning and understanding of hypothesis, computational approaches, and experimental tradeoffs. Includes an interdisciplinary video bioinformatics research project. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

EE 276 Colloquium in Video Bioinformatics 1 Colloquium, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers current research topics in video bioinformatics. Includes presentations by faculty members and visiting researchers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

EE 277 Data Centric Computer Architecture 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CS 161; graduate standing; or consent of instructor. Addresses the rapid growth of dataset size and the introduction of hardware accelerators, resulting in the data movement overhead becoming the major performance bottleneck. Includes system interconnects, I/O stacks, emerging nonvolatile memory technologies, near-data processing, and data flow architectures. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 277.

EE 279 Capstone Project in Data Science 4 Lecture, 1 hour; research, 6 hours; extra reading, 3 hours. Prerequisite(s): CS 252A or EE 251A; CS 252B or EE 251B; graduate standing; or consent of instructor. Covers technical, analytic, and interpretive skills to design and execute a large-scale data science capstone project focusing on real-world applications. Provides an opportunity to integrate all of the core skills and concepts learned throughout the program. Prepares for long-term professional success in the field. Cross-listed with CS 279.

EE 281A Digital Communications 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Topics include modulation, probability and random variables, correlation and power spectra, information theory, errors of transmission, equalization and coding methods, shift and phase keying, and a comparison of digital communication systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 281A or EE 150.

EE 281B Image Processing 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers digital image acquisition, image enhancement and restoration, image compression, and computer implementation and testing of image processing techniques. Provides hands-on experience of complete image processing systems, including image acquisition, processing, and display. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 281B or EE 152.

EE 282A Introduction to Very Large Scale Integration Design 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Studies integrated circuit fabrication, device characterization, and circuit simulation. Introduces basic device physics and physical design rules, MOS logic design, and timing and clock schemes. Covers layout generation, subsystem designs, and circuits for alternative logic styles. Also covers design and simulation using hardware description language and CAD tools. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 282A, CS 168, or EE 168.

EE 282B Radio Frequency Circuit Design 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Studies design and analysis of radio frequency (RF) circuits. Topics include multiport networks; scattering matrix and S-parameters; transmission lines; matching networks; Smith Chart; RF electromagnetic analysis of waveguides, antennas, filters, and couplers; RF transistor equivalent modeling; low-noise amplifier design; noise figure; oscillators and mixers; and phase lock loop. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 282B or EE 118.

EE 282C Analog Integrated Circuit Layout and Design 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers analog circuit design, layout, and verification of complementary metal oxide semiconductors (CMOSs) with use of computer-aided design tools. Topics covered include analog metal oxide semiconductor field effect transistor (MOSFET) models, current sources, references, amplified design, nonlinear analog circuits, dynamic analog circuits, analog-to-digital converters (ADCs), and digital-to-analog converters (DACs). May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 282C or EE 135.

EE 282D Design For Reliability of Integrated Circuits and Systems 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers essentials of electrical transient induced failures to integrated circuits (IC) and systems. Addresses basics for different failure and testing models including electrostatic discharge (ESD). Discusses design-for-reliability (DFR) techniques such as ESD protection designs at IC, module, and system levels. Enhances learning with computer aided design (CAD) laboratories. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 282D or EE 165.

EE 283A Foundations of Robotics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Provides foundational knowledge on analysis, control, and programming of robots. Considers configuration space, rigid body motion, forward, inverse and velocity kinematics, dynamics, trajectory planning, robot motion control, localization and mapping, and robot ethics. Integrates hands-on labs to program robots in simulation and experimentally by reading and interpreting sensor data. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 283A, EE 144, or ME 144.

EE 283B Introduction to Digital Control 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Reviews continuous-time control systems, Z-transform and properties, sampled-data systems, stability analysis and criteria, and frequency domain analysis and design. Addresses transient and steady-state response, state-space techniques, controllability and observability, pole placement, observer design, and Lyapunov stability analysis. Laboratory experiments

complementary to these topics include simulations and hardware design. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 283B or EE 151.

EE 284A Intro to Engineering Optimization Techniques 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduction to formulating and solving optimization problems in engineering. Includes single-variable and multi-variable optimization; linear programming-simplex method; nonlinear unconstrained optimization-gradient, steepest descent, and Newton methods; and nonlinear constrained optimization-gradient projection methods. Addresses applications of optimization in engineering design problems. Solves various engineering optimization examples using MATLAB. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 284A or ENGR 160.

EE 284B Computer Vision 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers imaging formation, early vision processing, boundary detection, region growing, two-dimensional and three-dimensional object representation, and recognition techniques. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 284B or EE 146.

EE 285A Semiconductor Device Processing 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Presents device simulations and hands-on experience in integrated-circuit fabrication techniques and device characterization. Uses four-mask metal-oxide semiconductor (MOS) technology to fabricate resistors, junctions, capacitors, and MOS transistors as well as to perform electrical evaluation. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 285A or EE 136.

EE 285B Introduction to Semiconductor Optoelectronic Devices 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. An introduction to semiconductor optoelectronic devices for optoelectronic communications and signal processing. Topics include basic optical processes in semiconductors, semiconductor light-emitting diode, semiconductor heterojunction lasers, photodetectors, solar cells, optoelectronic modulation, and switching devices. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 285B or EE 137.

EE 285C Electrical Properties of Materials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduces the electrical properties of materials. Includes the electron as a particle and a wave; hydrogen atom and the periodic table; chemical bonds; free-electron theory of metals; band theory of solids; semiconductors and dielectrics; measurements of material properties; and growth and preparation of semiconductors. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 285C or EE 138.

EE 285D Magnetic Materials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduces fundamentals of magnetic materials for the next-generation magnetic, nanomagnetic, and spintronics-related technologies. Includes basics of magnetism, models of the equivalent magnetic charge and current, paramagnetic and diamagnetic materials, soft and hard magnetic materials, equivalent magnetic circuits, and magnetic system design foundations. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 285D or EE 139.

EE 285E Introduction to Nanoelectronics 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Presents the basic concepts of nanoelectronics focusing on current flow through nanostructured devices. Topics include new paradigms of nanoelectronics, an atomistic view of electrical resistance, Schroedinger's equation, Coulomb blockade, basis functions, bandstructure, quantum capacitance, level broadening, and coherent transport. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 285E or EE 162.

EE 286A Power System Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Covers long-distance transmission of electric power. Emphasizes admittance and impedance modeling of components and systems; optimal power flow calculations and applications; symmetrical and asymmetrical fault calculations; economic operation of large-scale generation and transmission systems; and analysis of transmission and distribution networks. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 286A or EE 155.

EE 286B Electric Drives 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Topics include the study of electro-mechanical energy conversion, magnetic circuits, and magnetic components. Also explores linear motors, direct-current motors, induction motors, reluctance motors, and synchronous motor drives. Addresses space vectors in alternating current machines and the analysis and design of feedback controllers. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 286B or EE 153.

EE 286C Power Electronics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers the study of power semiconductor devices. Includes magnetic circuits and components; switch mode converters and power supplies; and single, three-phase, pulse width modulation, and resonant pulse inverters. Addresses voltage controllers; direct current and induction motor drives; and design of motion control drive circuits for robotic and industrial automation systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following EE 286C or EE 123.

EE 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and Graduate Advisor. Individual study, directed by a faculty member, of selected topics in electrical engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

EE 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Research conducted under the supervision of a faculty member on selected problems in electrical engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

EE 298I Individual Internship in Electrical Engineering 1 to 12 Internship, 2 to 24 hours; written work, 1 to 12 hours. Prerequisite(s): graduate standing; consent of instructor. Provides the Electrical Engineering graduate student with career experience as an electrical engineer in an industry or a research unit. Includes fieldwork with an approved professional individual or organization and academic work under the direction of a faculty member. Requires a final report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

EE 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing; consent of instructor./ Research in electrical engineering for the M.S. thesis or Ph.D. dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Engineering

Subject abbreviation: ENGR
The Marlan and Rosemary Bourns College of Engineering

Advising Office, 310 Skye Hall
(951) 827-ENGR (3647);
student.engr.ucr.edu

Courses in Engineering are a multidisciplinary approach to providing students with training in concepts common to multiple engineering fields. The courses support the undergraduate programs in all disciplines in the Marlan and Rosemary Bourns College of Engineering. Refer to these programs in this section of the catalog for information on course application.

Lower-Division Courses

ENGR 001 (E-Z) Professional Development and Mentoring 1 Activity, 30 hours per quarter. Provides freshmen with involvement in professional development activities. Activities to be performed are program-specific, and may include projects, industry overviews and interactions, involvement with professional societies and clubs, team building, career guidance, and coverage of ethics and lifelong learning issues. E. Bioengineering; F. Chemical Engineering; G. Computer Engineering; I. Computer Science; J. Electrical Engineering; K. Environmental Engineering; M. Computer Science With Business Applications; N. Mechanical Engineering.

ENGR 002 (E-Z) Professional Development and Mentoring 1 Activity, 30 hours per quarter. Prerequisite(s): restricted to class level standing of sophomore; restricted to major(s) Bioengineering, Bioengineering BS + MS, Chemical Engineering, Chemical Engineering BS + MS, Computer Engineering, Computer Science, Computer Science BS + MS, Electrical Engineering, Electrical Engineering BS + MS, Environmental Engineering, Environmental Engr BS + MS, Materials Science and Engineer, Mechanical Engineering, Mechanical Engineering BS + MS. Provides sophomores with involvement in professional development activities. Activities to be performed are program-specific, and may include projects, industry overviews and interactions, involvement with professional societies and clubs, team building, career guidance, and coverage of ethics and lifelong learning issues. E. Bioengineering; F. Chemical Engineering; G. Computer Engineering; I. Computer Science; J. Electrical Engineering; K. Environmental Engineering; M. Information Systems.

ENGR 010 Introduction to Engineering 2 Discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): none. Introduction to and experience with common everyday engineering and technology devices. Aims to enrich students' appreciation of technology and the application of simple science and engineering concepts in the design and operation of these devices, and to provide students with an early positive engineering experience and interaction with College of Engineering faculty. Graded Satisfactory (S) or No Credit (NC).

ENGR 060 Engineering Economics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009A. Covers economic decisions involving engineering alternatives. Topics include time value of money, annual cost, present worth, rate of return, and benefit-to-cost. Addresses before and after tax replacement economy, organizational financing, break-even analysis, risk analysis, and capital budgeting. Cross-listed with ECON 060.

ENGR 092 First-Year Seminar in Engineering 1 Seminar, 10 to 15 hours per quarter. Prerequisite(s): freshman standing; sophomores may enroll on a space-available basis with consent of instructor. Introduction to one of the many areas of study explored by the faculty of the College of Engineering in a small-group, highly interactive format. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 3 units of any combination of ENGR 092, HASS 092, and NASC 092; students may enroll in only 1 unit of ENGR 092, HASS 092, or NASC 092 per quarter.

ENGR 096 Environment and Society 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): lower-division standing or consent of instructor. Presents major environmental issues facing society from an interdisciplinary perspective. Topics may include water, energy, climate change, and urbanization. Cross-listed with NASC 096, and HASS 096.

Upper-Division Courses

ENGR 101 (E-Z) Professional Development and Mentoring 1 Activity, 30 hours per quarter. Prerequisite(s): restricted to class level standing of junior; restricted to major(s) Bioengineering, Bioengineering BS + MS, Chemical Engineering, Chemical Engineering BS + MS, Computer Engineering, Computer Science, Computer Science BS + MS, Electrical Engineering, Electrical Engineering BS + MS, Environmental Engineering, Environmental Engr BS + MS, Materials Science and Engineer, Mechanical Engineering, Mechanical Engineering BS + MS. Provides opportunities with involvement in professional development activities. May include projects, industry overviews and interactions, involvement with professional societies and clubs, team building, career guidance, and coverage of ethics and lifelong learning issues. E. Bioengineering; F. Chemical Engineering; G. Computer Engineering; I. Computer Science; J. Electrical Engineering; K. Environmental Engineering; M. Computer Science With Business Applications.

ENGR 108 Technology in the Premodern World 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Survey of technological developments in ancient and early-modern Japan, China, India, the Middle East, Africa, Central and South America, and Europe. Focuses on key mechanical and civil technologies and the role of the state in their development. Cross-listed with HIST 108.

ENGR 109 Technology in Modern Europe and America, 1700-Present 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the emergence of modern Europe through the first and second industrial revolutions in Europe and America. Explores the development of device commodities as the typical form of consumer technology in the nineteenth and twentieth centuries, as well as addresses philosophical issues in understanding technology. Cross-listed with HIST 109.

ENGR 110 Innovar (innovation Program); Customer Discovery & Business Model Generation 4 Lecture, 2 hours; consultation, 1 hour; individual study, 3 hours. Prerequisite(s): Business idea using technology is required; restricted to class level standing of junior, ; Instructor's consent for enrollment's approval; and consent of instructor. Provides a hands-on introduction to entrepreneurship through the Innovation Program (Innovar). Applies customer discovery to explore commercial potential of a business idea or technology. Includes use of Lean Launchpad to define product-market fit. Requires at the time of enrollment a business idea for a product or service that uses technology.

ENGR 118 Engineering Modeling and Analysis 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CHEM 001A or CHEM 01HA; CS 009A; MATH 046; PHYS 040B or PHYS 040HB; or consent of instructor. Covers the formulation of mathematical models for engineering systems. Includes applying mass, momentum, and energy balances to derive governing differential equations; solving equations with the use of spreadsheets and other software packages; and fitting linear and nonlinear models to experimental data. Credit is awarded for one of the following ENGR 118 or ME 118.

ENGR 160 Introduction to Engineering Optimization Techniques 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A; CS 010A or EE 020B or ME 018A, ME 018B; for the ENGR 160 online section; enrollment in the Master-in-Science in Engineering program. Introduction to formulating and solving optimization problems in engineering. Includes single-variable and multi-variable optimization; linear programming - simplex method; nonlinear unconstrained optimization-gradient, steepest descent, and Newton methods; and nonlinear constrained optimization - gradient projection methods. Addresses applications of optimization in engineering design problems. Solves various engineering optimization examples using MATLAB. Credit is awarded for one of the following ENGR 160 or EE 284A.

ENGR 170 Technology, Policy, and Ethics 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): upper-division standing. Provides contemporary perspectives on interplays between technology, public policy, and ethics. Covers social, legal, and ethical issues such as liability, as well as environmental, patent, and copyright law. Cross-listed with PBPL 170.

ENGR 171 Globalization 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Covers technological drivers of globalization. Includes social, economic, and political consequences. Explores the cultural aspects of globalization, including barriers and drivers for economic and cultural interdependence and integration. Also explores virtual global organizations. Cross-listed with NASC 171, and PBPL 171.

ENGR 180W Technical Communications 4 Lecture, 3 hours; workshop, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 040Q; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; restricted to class level standing of junior, or senior. Develops oral, written, and graphical communication skills. Includes preparing and critiquing reports, proposals, instructions, and business correspondence. Emphasizes professional and ethical responsibilities and the need to stay current on technology and its global impact on economics, society, and the environment. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits as alternatives to WRIT 030.

ENGR 181W Technical Communications and Documentation 4 Lecture, 3 hours; workshop, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 040R; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; restricted to class level standing of senior. Develops technical communication and documentation skills. Includes writing and critiquing design documentation and technical reports. Uses the capstone design project in an engineering discipline as a case study. Considers professional and ethical responsibilities as well as contemporary issues in engineering and the global impact on economics, society, and the environment. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits as alternatives to WRIT 030.

ENGR 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): upper-division standing or consent of instructor. To be taken with the consent of the chair of the appropriate Engineering program as a means of meeting special curricular problems. Units in this course may not be used to meet requirements for the major unless so designated as a replacement for a requirement not being offered during the student's remaining tenure. Course is repeatable to a maximum of 9 units.

ENGR 191S Seminar in Sacramento 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Center at Sacramento Program. Examines aspects of the Sacramento area, including cultural, political, and governmental institutions and the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Sacramento. Required of participants in the UCR Center at Sacramento Program. Cross-listed with HASS 191S, and NASC 191S.

ENGR 198I Individual Internship 1 to 12 Internship, 3 to 36 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Designed to provide experience as a practicing engineer in a governmental, industrial, or research unit. Jointly supervised by an off-campus sponsor and an Engineering faculty member. Requires a written final report. Units may not be used to satisfy major requirements. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

Graduate Program

The Bourns College of Engineering (BCOE) offers an online Master of Science (M.S.) degree in Engineering.

Online M.S. Graduate Program Assistant
(951) 827-5196, MSE 313

Kambiz Vafai, Ph.D., Program Director

Online M.S. Committee

Evangelos Christidis, Ph.D. (Computer Science)
Thomas Fryer Ph.D. (Online Engineering)
Heejung Jung, Ph.D. (Mechanical Engineering)
Bahram Mobasher, Ph.D. (Physics and Astronomy)
Hamed Mohsenian-Rad, Ph.D. (Electrical and Computer Engineering)
Cengiz Ozkan, Ph.D. (Mechanical Engineering)
Victor Rodgers, Ph.D. (Bioengineering)
Bryan Wong, Ph.D. (Chemical and Enviromental Engineering)

Online Master's Degree

The online (M.S.) degree program is designed for working professional engineers who wish to advance their knowledge in a field and enhance their value in the workplace. Students in the program receive course materials including lectures, notes, assignments, and announcements over the internet. Exams are given by proctors at regional locations.

The BCOE online master's program combines engineering and professional development classes. Another key component is a significant design experience, incorporating additional readings and knowledge of the courses taken.

Admission

The following criteria are considered during the admission process for the MSOL program:

1. A bachelor's degree in engineering or related field from an accredited institution
2. Official transcripts
3. Grade Point Average (GPA)
4. Graduate Record Examination (GRE)/ Fundamentals of Engineering (FE) scores*
5. TOEFL or IELTS scores (for international applicants)
6. Evidence of significant professional engineering experience
7. Professional certifications
8. Reference letters

*The GRE is optional for applicants with a GPA of 3.0 or higher.

Course Requirements

Students must complete 36 units (9 courses), six of which must be at the 200 level, including:

1. Most specializations require four collegewide core courses from the professional engineering series for the core requirements. ENGR 200: Engineering in the Global Environment, ENGR 201: Technology Innovation and Strategy for Engineers, ENGR 202: Introduction to Systems Engineering, ENGR 203: Principles of Engineering Management.
2. Four specialization courses in an engineering concentration area are listed for each specialization below. If necessary, students may substitute a total of one course from another specialization with approval of the MSOL director. Additionally, students may substitute a total of one core course with an additional specialization course, making it a total of five specialization courses with the approval of the MSOL Director.
3. Only four units of ENGR 296 can be used towards graduation. Course is repeatable to a maximum of 8 units.

MSOL Specializations

Bioengineering

This specialization emphasizes principles and application of bioengineering based on a solid fundamental foundation in biological science and engineering to equip students with diverse communications skills and training in the most quantitative bioengineering research so that they can become leaders in their respective fields. Students can substitute a total of one course from the Environmental Engineering Systems or Mechanical Engineering specializations.

BIEN 201: Mathematical Methods for Bioengineering
BIEN 223: Engineering Analysis of Physiological Systems
BIEN 224: Cellular and Molecular Engineering
BIEN 249: Integration of Computational and Experimental Biology
BIEN 264: Biotransport Phenomena
BIEN 270: Transport with Reactions in Biological Systems

Chemical

Chemical engineering applies its unique skills to improve healthcare, energy availability, chemicals and materials, and public safety.

CEE 200: Advanced Engineering Computation
Develops problem-solving techniques for basic engineering systems including heat and mass transfer, coupled reactions, fluid flow potential, and control.

CEE 202: Transport Phenomena
Topics include transport phenomena, potential flow, and boundary layer theories with applications to simultaneous heat, momentum, and mass transfer. Introduces numerical techniques used to solve advanced transport phenomena problems.

CEE 204: Advanced Kinetics and Reaction
Engineering Emphasizes kinetics and

mechanisms of heterogeneous reactions in different types of reactors. Specific topics include gas-solid noncatalytic reactions; catalytic surfaces and catalyst characterization; and adsorption, diffusion, reaction, and heat transfer in porous catalysts.

CEE 206: Advanced Chemical Engineering Thermodynamics
Application of the laws of thermodynamics to phase and chemical reaction equilibrium. Introduction to statistical thermodynamics, molecular simulations, and the evaluation of thermodynamic properties from molecular simulations.

Data Science

Any four of the following courses will be sufficient for the specialization course requirements for this specialization. If necessary, students can substitute a total of one course: BIEN 249, ME 230, or MSE 248.

STAT 206: Statistical Computing

STAT 208: Statistical Data Mining Methods

CS 167: Introduction to Big-Data Management

CS 224: Fundamentals of Machine Learning

CS 229: Machine Learning

CS 230: Computer Graphics

CS 235: Data Mining Techniques

CS 236: Database Management Systems

CS 242: Information Retrieval and Web Search

EE 240: Pattern Recognition

EE 241: Advanced Digital Image Processing

EE243: Advanced Computer Vision

PHYS 243: Foundation of Applied Machine Learning

PHYS 244: Application of Visualization in Data Science

PHYS 247: Introduction to Applied Data Science

Electrical Engineering – Power Systems:

This specialization emphasizes the principles and common research trends in electric power systems analysis and operation and smart grid applications.

EE 123: Power Electronics; (or EE153: Electric Drives)

EE 155: Power Systems Analysis

EE 218: Power System Steady State and Market Analysis

EE 232: Introduction to Smart Grid

EE 234: Smart Grid Sensors and Data Driven Applications

* A prerequisite for EE 218 is required. EE 155 and ENGR 160 must be taken first.

The students for the EE specialization will also need to take ENGR160 (Introduction to Engineering Optimization Techniques) in addition to three other core professional courses. That is the core professional courses for EE specialization will be ENGR160 plus three of the four core professional courses which are ENGR 200: Engineering in the Global Environment; ENGR 201: Technology Innovation and Strategy for Engineers; ENGR 202: Introduction to Systems Engineering and ENGR 203: Principles of Engineering Management.

Engineering Management: The Engineering Management specialization prepares engineers to lead and manage teams, projects, and organizations with technical workforces to meet strategic objectives. This specialization emphasizes applying the management function in the technological setting while recognizing engineering systems' basic and applied sciences. Students will increase their engineering and management knowledge to develop and deliver new products and services while creating value for their organization and customers.

1. **Four of the following college-wide core courses from the professional engineering series will be sufficient for the core requirements:** ENGR 200: Engineering in the Global Environment, ENGR 201: Technology Innovation and Strategy for Engineers, ENGR 202: Introduction to Systems Engineering, ENGR 203: Principles of Engineering Management.
2. **Four specialization courses in the Engineering Management concentration:** ENGR 204: Projects Portfolio Management, ENGR 205: Quality Management, ENGR 206: Engineering Economics, ENGR 207: Engineering Leadership and Organizational Behavior.
3. **Four units** of ENGR 296V

ENGR 200: Engineering in the Global Environment

ENGR 201: Technology Innovation and Strategy for Engineers

ENGR 202: Introduction to Systems Engineering

ENGR 203: Principles of Engineering Management

ENGR 204: Projects Portfolio Management

ENGR 205: Quality Management

ENGR 206: Engineering Economics

ENGR 207: Engineering Leadership and Organizational Behavior

Environmental Engineering Systems (Water):

Through a series of professional development and technical courses, this specialization will equip students with knowledge and insights that are needed for leadership in a water-related environmental engineering career at a consulting firm, water/wastewater agency, federal/state regulatory agency, or a large company. Students can substitute a total of one course from the Bioengineering or Mechanical Engineering specialization.

CEE 225: Physical and Chemical Separation Processes

CEE 226: Biological Treatment Processes

CEE 241: Water Chemistry in Natural and Engineered Systems

CEE 243: Advanced Water Treatment Technologies

CEE 249: Integration of Computational and Environmental Engineering

Materials at the Nanoscale

In addition to course work on engineering management, systems, innovation and strategy, and working in a global environment, this program will focus on a broad range of nanoscale processes and applications through courses from UCR's interdisciplinary Materials Science and Engineering program. Students can substitute a total of two courses from the Mechanical Engineering specialization.

MSE 201: Thermodynamic Foundations of Materials

MSE 210: Crystal Structure and Bonding

MSE 238: Introduction to Microelectromechanical Systems

MSE 248A: Nanoscale Science and Engineering

Mechanical Engineering

In addition to course work on engineering management, systems, innovation and strategy, and working in a global environment, this program will focus on a broad range of courses in Sustainable Product Design, Fluid Systems, Secure and Reliable Control Systems and Manufacturing and Materials Processing. Students can substitute a total of two courses from the Bioengineering or Materials at the Nanoscale specialization.

ME 203: Design and Analysis of Engineering Experiments

ME 210: Sustainable Product Design

ME 223: Secure and Reliable Control Systems

ME 226: Vehicle Dynamics

ME 230: Computer-Aided Engineering Design

ME 240A: Fundamentals of Fluid Mechanics

ME 270: Introduction to Microelectromechanical Systems

ME 272: Nanoscale Science and Engineering

ME 274: Plasma-aided Manufacturing and Materials Processing

Specialization courses are offered by the participating derpartments, whereas core courses are offered at the college level to all students. Specialization courses are taught by BCOE faculty as traditional classes to on-campus M.S. and Ph.D. students while also being delivered to online students. Online students are expected to satisfy the same requirements as on-campus students.

Automotive and Mobility Engineering: The program combines conventional and emerging areas of automotive and transportation engineering which are interconnected with advent of electrification of vehicles. The program emphasizes internal combustion engines, fuels, emissions, connected transportation system, shared mobility, autonomous vehicles, zero emission vehicles, and intelligent transportation system.

1. **Two technical core courses:** EE 246: Intelligent Transportation Systems, ME 248: Internal Combustion Engines.
2. **Any two of the following Engineering Management core courses:** ENGR 200: Engineering in the Global Environment, ENGR 201: Technology Innovation and Strategy for Engineers, ENGR 202: Introduction to Systems Engineering, ENGR 203: Principles of Engineering Management.
3. **Any four of the specialization courses:** CEE 204: Advanced Kinetics and Reaction Engineering, CEE 233: Advanced Air Pollution Control and Engineering, CEE 235: Electrochemical Engineering, CEE 236: Energy: Production, Uses, Economics, and

Sustainability, ME 117: Combustion and Energy Systems, ME 136: Environmental Impacts of Energy Production and Conversion, ME 226: Vehicle Dynamics, ME 227: Vehicle Propulsion, EE 266: Advanced Topics in Connected and Automated Transportation Systems, ME 228: Introduction to Automotive Engineering.

For areas of specialization and further information, see **msol.ucr.edu**.

Graduate Courses

ENGR 200 Engineering in the Global Environment 4 Lecture, 4 hours. Prerequisite(s): graduate standing in Engineering. ENGR 200 online section; enrollment in the Online Master-in-Science in Engineering program. Addresses the adaptive challenges facing engineers in a global environment. Covers relevant business dynamics, national and international requirements, and less formal elements beyond the realm of core technical competence. Designed to widen the engineering practice framework to incorporate necessary added skills to succeed in an increasingly global environment.

ENGR 201 Technology Innovation and Strategy For Engineers 4 Lecture, 4 hours. Prerequisite(s): graduate standing in Engineering. ENGR 201 online section; enrollment in the Online Master-in-Science in Engineering program . Provides coverage of innovation, innovation project management, innovation protection management, organizational structuring and collaboration, and human resource management of technical professions. Brings together business models, leading academic research, and current organizational concerns in a blended learning environment that explores real companies and their strategies.

ENGR 202 Introduction to Systems Engineering 4 Lecture, 4 hours. Prerequisite(s): graduate standing in Engineering. ENGR 202 online section; enrollment in the Online Master-in-Science in Engineering program An introduction to systems, the systems design process, systems analysis and design evaluation, design for operational feasibility, and systems engineering management. Describes subjects such as requirements analysis, concept definition, system synthesis, design analysis, design tradeoffs, risk tradeoffs, interface definition, engineering design, and systems integration.

ENGR 203 Principles of Engineering Management 4 Lecture, 4 hours. Prerequisite(s): graduate standing in Engineering. ENGR 203 online section; enrollment in the Online Master-in-Science in Engineering program. Covers the essential managerial skills engineers need for managing in today's global economy. Exposes approaches to management that reveal constraints that guide business decisions. Topics include the functions of management: planning, organizing, leading, and controlling. Designed for engineers who manage people, projects, and technical innovation.

ENGR 204 Projects Portfolio Management 4 Lecture, 4 hours. Prerequisite(s): ENGR 204 online section: enrollment in the Online Master-in-Science in Engineering program. In-Person section; graduate standing. Covers assessment, planning, implementation, management, and monitoring of human resources across multiple projects, including communications and leadership roles. There will be a strong focus on Engineering topics.

ENGR 205 Quality Management 4 Lecture, 4 hours. Prerequisite(s): graduate standing in Engineering; For the ENGR 205 online section; enrollment in the Master of Science in Engineering program; graduate standing. Provides a competitive advantage to organizations that successfully integrate quality management principles. Covers current best practices, business models, leading academic research, and current challenges, bringing them together in a blended learning environment. Explores real companies and their strategies for implementing quality management principles that enhance their value.

ENGR 206 Engineering Economics 4 Lecture, 4 hours. Prerequisite(s): graduate standing in Engineering. For the ENGR 206 online section; enrollment in the Master of Science in Engineering program; graduate standing. Presents the techniques and methods that enable the engineer manager to make better informed decisions that improve the value of organizations. Integrates leading academic research and current organizational concerns. Explores real companies and their strategies for evaluating the economic potential of engineering managerial decisions.

ENGR 207 Engineering Leadership and Organizational Behavior 4 Lecture, 4 hours. Prerequisite(s): graduate standing in Engineering. For the ENGR 207 online section; enrollment in the Master of Science in Engineering program; graduate standing. Presents the techniques and methods that enable the engineer manager to evaluate, team-build, and manage high-performing, cross-functional teams to create a highly functional organizational culture. Brings together leading academic research and current organizational concerns in a blended learning environment to explore current challenges.

ENGR 296 Professional Project Design 1 to 4 Individual Study, 3 to 12 hours; written work, 3 to 12 hours. Prerequisite(s): enrollment in the Online Master in Science in Engineering program and consent of the instructor. A directed specialized professional written design project. The design project will have a literature review, abstract, introduction, discussion and conclusion along with references. The design project topic will be determined between the instructor and student. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units

English

Subject abbreviation: ENGL
College of Humanities, Arts, and Social Sciences

James Tobias, Ph.D., Chair

Timothy Petete, Ph.D.,
Director, Undergraduate Studies

Michelle Raheja, Ph.D.,
Director, Graduate Admissions

Fuson Wang, Ph.D.,
Director, Graduate Studies

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Professors

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andré carrington, Ph.D.
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Magda García, Ph.D.
Roberto Macias, Ph.D.

Professors Emeriti

Rise B. Axelrod, Ph.D.
Steven G. Axelrod, Ph.D., *Distinguished Professor*
John Briggs, Ph.D.
Joseph W. Childers, Ph.D.
Kimberly J. Devlin, Ph.D.
Robert N. Essick, Ph.D.
Carole Fabricant, Ph.D.
John M. Ganim, Ph.D., *Distinguished Professor*
Ralph Hanna, III, Ph.D.
Sarita See, Ph.D.
Katherine A. Kinney, Ph.D.
David Lloyd, Ph.D., *Distinguished Professor*
Fred Moten, Ph.D.
Deborah S. Willis, Ph.D.

Major

The English major offers a well-balanced, thought-provoking program for students with a serious interest in the study of literature and culture. Courses emphasize literature and literary theory from a wide range of perspectives. Questions concerning race and ethnicity, gender and sexuality, rhetoric and politics are included in most classes for the major. Non-majors are welcome in English classes, especially at the lower division.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The major requirements for the B.A. in English are as follows:

1. **Lower-division requirements (at least 13 units, but no more than 20 units):**
   a) Any three of the following courses
      1. ENGL 020A British Empire
      2. ENGL 020B America Literature & Culture
      3. ENGL 020C Alternative Critical Perspectives
      4. ENGL 021 Asian American
      5. ENGL 022 Native American/ Indigenous
      6. ENGL 023 African American
      7. ENGL 024 Chicanx
      8. ENGL 025 LGBTQI
      9. ENGL 033 Multimodal Literacies
2. **Upper-division requirements (35-46 units):**
   a) ENGL 102, or 102W. This course should normally be taken prior to or concurrently with the student's first upper-division English course.
   b. Two courses covering material from before 1900, chosen from the following: ENGL 112, ENGL 117A, ENGL 117B, ENGL 117C, ENGL 117D, ENGL 117T, ENGL 120A, ENGL 127A, ENGL 130, ENGL 131, ENGL 132, ENGL 149, ENGL 151A. ENGL 151B, ENGL 151C, ENGL 151D, ENGL 152, ENGL 153, ENGL 154, ENGL 161, ENGL 166A, ENGL 166B, ENGL 166T, ENGL 172, ENGL 172T
   c. Race and Ethnicity Requirement: This course can also count towards requirements 2b or 2c or 2f. This course is to be chosen from among the following: ENGL 120A, ENGL 120B, ENGL 120T, ENGL 121, ENGL 122, ENGL 136A, ENGL 136B, ENGL 136T, ENGL 137, ENGL 138A, ENGL 138B, ENGL 138C, ENGL 138T, ENGL 139, ENGL 139T, ENGL 144, ENGL 145K, ENGL 186
   d. English 188: Literature and the Professions or English 189: Capstone Research Seminar.
   e. Additional Upper Division Courses: Seven additional upper-division English courses worth 4 units each. Only 4 units from either ENGL 103 will be accepted toward the fulfillment of this requirement. One course worth 4 units of ENGL 190 may be counted toward this requirement. Proposals for ENGL 190 must be approved by a sponsoring faculty member and the department chair. If the student wishes to offer units from ENGL 190 as part of the additional upper-division courses, a copy of an approved petition will be placed in the student's file.

Students are not allowed more than 20 units at the lower-division level.

Each student works with the Undergraduate Academic Advisor and the Faculty Advisor for help in shaping a program and following it through to graduation. Students should see the advisors on a regular basis, normally once per quarter prior to registration. Information about times and meeting places for advisors is posted online and is available in the department office from the undergraduate academic advisor.

Minor

The English minor is designed to provide an overview of English and American literature, an opportunity for the exercise of disciplined literary analysis, and a varied experience of the best literature in English.

1. Lower-division requirements (14 units)
   a) ENGL 012 Introduction to Literature or ENGL 014 North American Writers
   b) Any two of the following courses:
      ENGL 020A British Empire
      ENGL 020B America Literature & Culture
      ENGL 020C Alternative Critical Perspectives
      ENGL 021 Asian American
      ENGL 022 Indigenous
      ENGL 023 African American
      ENGL 024 Chicanx
      ENGL 025 LGBTQI
      ENGL 033 Multimodal Literacies
2. Upper-division requirements (16 units)
   a) Four courses of upper-division English. Only four (4) units from ENGL 103 or ENGL 190 will be accepted toward fulfillment of this requirement. Proposals for ENGL 190 must be approved by a sponsoring faculty member and the department chair. If the student wishes to offer units from ENGL 190 as part of the 16 units, a copy of the approved petition will be placed in the student's file.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

University of California Entry-Level Writing Requirement

For regulations governing the University of California Entry-Level Writing Requirement, see Requirements for the Bachelor's Degree in the Undergraduate Studies section of this catalog. Students who have fulfilled the requirement may enroll in ENGL 001A. Students who are held for the requirement must take the University of California Analytical Writing Placement Exam. Results determine which course(s) a student should take to satisfy university requirements. Visit elwr.ucr.edu for more information. You may also contact the University Writing Program at (951) 827-1384.

Teaching Credential Preparation Programs

Students interested in becoming teachers at the elementary or secondary school level may combine the English major with a program of study leading to the multiple subjects (elementary) or single subject (secondary) credential preparation program. Details and counseling on the Prepare to Teach Program, a preparation program for the multiple subjects credential, are available in the Office of Interdisciplinary Programs, 3111 INTS, (951) 827-1801. Details and counseling on other programs are available in the Department of English or the School of Education.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Graduate Program

The Department of English offers the Ph.D. degree in English.

Doctoral Degree

The Department of English offers the Ph.D. degree in English.

The doctoral program in English prepares students to become informed teachers and scholar-critics capable of significant original literary scholarship.

Admission

Admission is open to qualified candidates with a B.A. or M.A. degree, preferably in English or a related field. Students with an M.A. in another field may be required to take additional course work.

Course Work

ENGL 200 is required for all new graduate students. Students entering the program without an M.A. must complete (with a grade of "B" or better) a minimum of 52 units of course work, including ENGL200. Prior to taking Qualifying Examination I, students must meet the course work requirement of the M.A. Degree (36 units). Upon successfully passing Qualifying Examination I, students must complete at least an additional four seminars (16 units) in 200-level course work. The candidate with an M.A. from another institution must complete (with a grade of "B" or better) a minimum of 36 units of course work in 200-level courses, including ENGL200. No courses graded S/NC may be used for these required doctoral units, including ENGL 280, ENGL 292, ENGL 297, and ENGL 299. When coursework is drawing to a close, all students, in consultation with the graduate advisor, and upon approval by the graduate committee, select three fields of study to prepare for their Qualifying Exam II. Once course work requirements are satisfied, all students take the Qualifying Examination II

and complete a dissertation.

Qualifying Examinations I and II
At the end of the sixth quarter, students who have entered the program with a B.A. become eligible to receive an M.A. upon completion of the Qualifying Examination I. For this examination, students submit a portfolio of two essays, that have been substantially revised in consultation with the examining committee, and a 1000- to 1500- word metacommentary explaining the aims and achievements of the essays and their contributions to a coherent research agenda. The student is then examined orally for one hour on the portfolio and two distinct fields related to the two essays. Following successful completion of this examination and a review of the entire student file, the graduate committee recommends the awarding of the M.A. degree. (The Qualifying Examination I is waived for students with an M.A. from another institution.)

After the completion of all course work, students take the Qualifying Examination II to be advanced to candidacy. The Qualifying Exam II is three hours long. The oral examination includes a short presentation by the student followed by questions and comments from the examining committee based on portfolio materials the student has submitted and the oral presentation. Following the successful completion of this examination, the student will be advanced to candidacy if all coursework and language requirements are also completed.

The Oral Qualifying Exam can be taken in one of the following modes: In-Person, Remote, or Hybrid. The student and their advisor will discuss and make the final determination together which mode best suits the subject matter. Students taking the exam In-Person are expected to present on campus with all committee members physically present, and with staff present to assist the student on campus. If Hybrid is chosen, the student is expected to present the exam on campus in a video enabled room that supports some members physically present and others remote, and with staff present to assist the student on campus. The chair of the committee must be physically present for a Hybrid exam. If Remote is chosen, the chair of the committee must be the host or co-host of a video enabled meeting.

Professional Development
The English department is aware of the current challenges facing our graduate students when they apply for academic and non-academic jobs while ABD or right after graduating. We have implemented a professionalization program consisting of information sessions, invited speakers, and seminars/workshops to address these challenges. This program will help make our graduate students more competitive on the academic job market and help them explore career options outside the academy. We wish to highlight ENGL410 Seminar in Professional Development, a 2-unit course designed to help students develop their teaching skills, academic publishing, and job application documents. Graduate students will need to take at least one ENGL410 (2 units), graded S/NC, to fulfill their professional development requirement and can take up to 6 units because course content may change each quarter.

Dissertation and Final Defense
The dissertation should be related to the individualized course of study preceding it and should draw out the best research and critical talents of the candidate.

Before the dissertation is given final approval, a public dissertation defense is required. The defense must be advertised to the campus community and is open to all who wish to attend. Following the public defense, the student meets with the dissertation committee to discuss the student's dissertation in accordance with the regulations of the Graduate Division.

For a more detailed description of the requirements for the Ph.D., contact the Graduate Assistant, Department of English.

The Final Defense can be completed in one of the following modes: In-Person, Remote, or Hybrid. The student and their advisor will discuss and make the final determination together which mode best suits the subject matter. Students defending In-Person are expected to be present on campus with all committee members physically present, and with staff present to assist the student on campus. If Hybrid is chosen, the student is expected to defend on campus in a video enabled room that supports some members physically present and others remote, and with staff present to assist the student on campus. The chair of the committee must be physically present for a Hybrid defense. If Remote is chosen, the chair of the committee must be the host or co-host of a video enabled meeting.

Normative Time to Degree including UCR M.A. Work
18 quarters (or 15 quarters for students with an M.A. from another institution)

Lower-Division Courses

ENGL 012 Special Topics in Introduction to Literature 4 Lecture, 3 hours; extra reading, 3 hours. An introduction to the study of topics, themes, or types of literature. Texts may be selected from any one or a combination of several time periods, genres, or forms. Topics include various national and ethnic literatures, LGBTQ+ literature, disability literature, and children?s literature. Intended primarily for non-majors. Course is repeatable as content or topic changes to a maximum of 8 units. Credit is awarded to a maximum of 10 units for either or both ENGL 012 or ENGL 012S with different titles.

ENGL 012S Special Topics in Introduction to Literature 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. An introduction to the study of topics, themes, or types of literature. Texts may be selected from any one or a combination of several time periods, genres, or forms. Topics include various national and ethnic literatures, LGBTQ+ literature, disability literature, and children?s literature. Intended primarily for non-majors. Course is repeatable as content or topic changes to a maximum of 10 units. Credit is awarded to a maximum of 10 units for either or both ENGL 012 or ENGL 012S with different titles.

ENGL 014 Topics: North American Writers 4 Lecture, 3 hours; extra reading, 3 hours. Explores key works by important writers in North American literary expression. Course is repeatable as content or topic changes to a maximum of 8 units.

ENGL 016 Adaptations of Literary Works 4 Lecture, 3 hours; screening, 3 hours; extra reading, 2 hours. A study of adaptations of literary works in other media including film, television, and video game. Addresses questions of medium and its affordances, context of production/reception, and narrative analysis. Specific works to be studied vary by offering and include literary texts from a range of historical periods and formal genre. Course is repeatable as content or topic changes to a maximum of 12 units.

ENGL 019 Literature and Climate Change 4 Lecture, 3 hours; extra reading, 3 hours; individual study, 2 hours. Prerequisite(s): none. Considers how literary form and rhetorical effect are used by fiction writers, activists, and others wishing to mobilize action in relation to climate change. Includes study of how literature reflects cultural attitudes toward nature and environment. Draws examples from a range of genres and historical periods. Course is repeatable as content or topic changes to a maximum of 8 units.

ENGL 020A Literatures of the British Empire 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours; written work, 2 hours. Prerequisite(s): none. An introduction to literature produced in Britain, its colonies, and post-colonies from the origins to the present in the context of emergent and enduring political, economic, and racial power.

ENGL 020B Introduction to American Literary and Cultural Studies 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours; written work, 2 hours. Prerequisite(s): none. A thematic introduction to the study of American literature and culture focusing on historical and cultural contexts.

ENGL 020C Introduction to Alternative Critical Perspectives On Literature and Culture 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours; written work, 2 hours. Introduces work associated with alternative critical traditions. Includes one or more of the following perspectives on culture: feminist, Marxist, critical ethnic, decolonial, disability, queer, and techno-cultural.

ENGL 021 Introduction to Asian American Literature 5 Lecture, 3 hours; extra reading, 6 hours. Introduction to the history, social background, culture, and literature of Asian America.

ENGL 022 Writing Red: Native American Literature 4 Lecture, 3 hours; extra reading, 3 hours. Acquaints students with a range of Native American literatures. Discusses mass-mediated images of Native Americans and how "Indianness" is constructed, contested, and embodied in poetry, film, autobiography, fiction, and photography.

ENGL 023 African American Literatures 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Introduces the study of African American literatures including autobiography, poetry, lyric, fiction, or non-fiction, in national, regional, transnational, or diasporic contexts.

ENGL 024 Chicana and Chicano Literature 4 Lecture, 3 hours; discussion, 1 hour. An introduction to Chicana/o/x literature. Explores teatro, poetry, short stories, novels, essays, and other genres particular to Chicana/o/x literary production from 1965 to the present.

ENGL 025 Modern and Contemporary Lgbtqi Arts and Media 5 Lecture, 3 hours; extra reading, 3 hours; individual study, 3 hours. Prerequisite(s): none. An introduction to key texts and moments in the variegated historical development of LGBTQI literatures, cultural production, and social formations. Course is repeatable as content or topic changes to a maximum of 10 units. Credit is awarded for one of the following ENGL 025 or ENGL 025S.

ENGL 025S Modern and Contemporary Lgbtqi Arts and Media 5 Lecture, 3 hours; discussion, 1 hour; screening, 3 hours. Prerequisite(s): none. An introduction to key texts and moments in the variegated historical development of LGBTQI literatures, cultural production, and social formations. Course is repeatable as content or topic changes to a maximum of 10 units. Credit is awarded for one of the following ENGL 025S or ENGL 025.

ENGL 033 Literacies For Multimodal Contexts 4 Lecture, 3 hours; discussion, 1 hour; research, 1.5 hours; written work, 1.5 hours. Studies information and its graphical, auditory, or interactive presentation in interdisciplinary, multimedia, and multimodal contexts. Analyzes information, sampling, and simulation as narrative, poetry, rhetoric, style, archive, or source. Utilizes hypertext or hypermedia criticism; information aesthetics; cyberfeminisms; Black software critique; queer technics; indigenous technologies; design discourse; digital activisms; and other methods.

ENGL 034W Writing For Multimodal Contexts 4 Lecture, 3 hours; practicum, 1.5 hours; research, 1.5 hours. Prerequisite(s): ENGL 001B with a grade of C or better. Studies non-fiction essay writing in multimodal formats and multimedia forms. Provides practice and review of student writing in audiovisual or interactive forms and genres. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to WRIT 030.

ENGL 035 Introductory Topics in Visual, Screen, and Performance Studies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introduction to methods for visual, screen, and performance studies. Course is repeatable as content or topic changes to a maximum of 8 units.

ENGL 040 Introduction to the English Department 1 Lecture, 1 hour. Prerequisite(s): none. Introduces the programs and offerings available in the English Department. Graded Satisfactory (S) or No Credit (NC).

Upper-Division Courses

ENGL 100 (E-Z) Scriptures, Myths, and Interpretation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Focuses on issues of scriptural and mythical analysis. Explores the impact of scripture and myth on literature written in English; textual development of the Hebrew scripture including the development of the King James version; major authors' uses of scripture and myth; exegesis; scripture and myth in current criticism and theory.

ENGL 100E The King James Bible as Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Readings from the Old Testament, New Testament, and Apocrypha; literary analysis of historiography, poetry, prophecy, philosophy, proverbs, letters, visions, with some consideration of problems of translation.

ENGL 100F Ancient Scriptures and the Literature of the African Diaspora 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Focuses on issues of scriptural and mythical analysis. Explores the impact of scripture and myth on literature written in English; the textual development of the Hebrew scripture; major authors' uses of scripture and myth; exegesis; and the place of scripture and myth in current criticism and theory.

ENGL 101 Critical Theory 4 Lecture,3 hours; consultation, 1 hour. A study of major theoretical issues in representative critical and scholarly works.

ENGL 102 Introduction to Critical Methods 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a major in English or consent of instructor. An in-depth analysis of the formal features of several genres, as well as an introduction to theoretical and critical approaches. Credit is awarded for only one of ENGL 102 or ENGL 102W.

ENGL 102W Introduction to Critical Methods 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a major in English; ENGL 001B with a grade of "C" or better; one of the following courses: ENGL 020A, ENGL 020B, ENGL 020C. An in-depth analysis of the formal features of several genres, as well as an introduction to theoretical and critical approaches. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits as alternatives to English 001C. Credit is awarded for only one of ENGL 102 or ENGL 102W.

ENGL 103 Advanced Composition 4 Lecture, 3 hours; discussion/consultation, 1 hour. Prerequisite(s): ENGL 001C or the equivalent. Principles of expository prose, with intensive practice. Advanced course in composition, not remedial. May be repeated for credit up to a maximum of 12 units.

ENGL 104 Film and Media Theory 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Covers different types of film and media theory. Addresses formalist, psychoanalytic, Marxist, feminist, and other approaches to the cinema and other media. Cross-listed with MCS 104.

ENGL 105 Slow Reading 2 Lecture, 2 hours; extra reading, 2 hours. Prerequisite(s): ENGL 102W or consent of instructor. Focused on the activity and experience of reading literature through sustained attention to a single work and individual reading practices. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.

ENGL 110 Nonfiction 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of freshman, sophomore, junior, or senior; or consent of instructor. An advanced study of forms, histories, and theories of nonfiction writing. Includes the essay, criticism, biography, creative nonfiction, and other types of expository writing. Course is repeatable to a maximum of 8 units.

ENGL 111 Studies in Environment, Embodiment, and Health 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines how literature shapes our constructed anthropocentric environments, policed norms about proper embodiment, and institutionalized models of health.

ENGL 112 History of the English Language 4 Lecture, 3 hours; consultation/discussion, 1 hour. An introductory survey of the history of English, including its Indo-European ancestry, its vocabulary and etymologies, changes in pronunciation, spelling, and grammar, development of dictionaries, and changing attitudes toward the language and usage.

ENGL 114 Rhetorical Studies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower division English course (other than composition) or consent of instructor. An introduction to and re-understanding of the place of rhetoric and language in culture. Includes topics such as reality and meaning, ethnic/American knowledges and identities, teaching practices, and the revival of historical traditions.

ENGL 115 Public Humanities 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): restricted to class level standing of freshman, sophomore, junior, or senior; or consent of instructor. An introduction to public humanities and the practice of doing humanities within and for the benefit of diverse publics. Develops understanding of the meaning of public humanities and of methods

and examples of public humanities projects.

ENGL 117A Early Shakespeare: Text and Performance 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An exploration of the early plays and poems of William Shakespeare focusing on text and performance histories.

ENGL 117B Late Shakespeare: Text and Performance 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An exploration of the late plays and poems of William Shakespeare focusing on text and performance histories.

ENGL 117C Twenty-First Century Shakespeares 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Engages with the work of William Shakespeare in the context of pressing, twenty-first century concerns.

ENGL 117D Shakespeare Across Cultures & Media 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores how, why, and by whom Shakespeare has been translated, adapted, and appropriated across languages and media forms. Contextualizes case study plays in early modern context and then considers adaptations that comment upon, reimagine, or resist the logic of Shakespeare's cultural influence. Course is repeatable as content or topic changes to a maximum of 8 units.

ENGL 117T Topics in Shakespeare 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A focused study of works by Shakespeare selected from different genres.

ENGL 120A Native American Literature to 1900 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or lower-division English course (other than composition); or consent of instructor. A critical study of Native American literature from the era of oral narrative to 1900. Focuses on autobiography and fiction as well as criticism and theory.

ENGL 120B Native American Literature After 1900 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical study of Native American literature from 1900 to the present, with special attention to poetry, visual culture, fiction, and self-life-narration, as well as criticism and theory.

ENGL 120T Studies in Native American Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): lower-division English course (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. A focused study of a topic, genre, period, or author in Native American literature. Examples include visual culture, oral narrative, collaborative autobiography, ethnography, or poetry.

ENGL 121 Special Topics in Postcolonial Literatures 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or lower-division English course (other than composition); or consent of instructor. Analyzes colonial discourse and the postcolonial condition of Asia, Africa, or the Caribbean. Topics may include historiography and subalternity; nationalism, gender, and sexuality; neocolonialism and trans-nationality; and theorizing resistance and the postcolonial identity. Course is repeatable as content or topic changes to a maximum of 8 units.

ENGL 122 Queer Texts and Bodies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A study of topics on gender, sexuality, and sexual identity. Covers issues such as gay and lesbian texts and contexts; sexual ideologies and literature; marginalized writers and texts; and the uses of theories of sexualities in the study of literature. Course is repeatable as content or topic changes to a maximum of 12 units. Cross-listed with GSST 114.

ENGL 124 Reading Gender 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A study of literature, art, media, and performance attentive to gender and representation, authorship, aesthetics, and interpretation in one or more time periods. Includes feminist, trans, nonbinary, and intersectional critical methods. Course is repeatable as content or topic changes to a maximum of 12 units.

ENGL 125 The Development of the Anglophone Novel 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines various aspects of the novel form such as narrative, questions of mimesis, and publishing practices. Integrates with the exploration of contemporary discourses relating to shifting conceptions of gender, sexuality, religion, science, class, and race. Course is repeatable as content or topic changes to a maximum of 12 units.

ENGL 126 Topics in American Fiction 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Covers thematic, formal, social, or historical study of American novels and short stories. Course is repeatable as content or topic changes to a maximum of 8 units. Credit is awarded for one of the following ENGL 126 or ENGL 126S.

ENGL 126S Topics in American Fiction 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Covers thematic, formal, social, or historical study of American novels and short stories. Course is repeatable as content or topic changes to a maximum of 8 units. Credit is awarded for one of the following ENGL 126S or ENGL 126.

ENGL 127A American Poetry: Before 1900 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a lower-division English course (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. A critical study of American poetry, focusing on the evolutionary and revolutionary aspects of its forms and themes. Credit is awarded for one of the following ENGL 127A or ENGL 127SA.

ENGL 127B American Poetry From Early to Mid Twentieth-Century 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a lower-division English course (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. A critical study of American poetry focusing on the evolutionary and revolutionary aspects of its forms and themes. Credit is awarded for one of the following ENGL 127B or ENGL 127SB.

ENGL 127C American Poetry: Later Twentieth-Century to the Present 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): or lower-division English course (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. A critical study of American poetry focusing on the evolutionary and revolutionary aspects of its forms and themes. Credit is awarded for one of the following ENGL 127C or ENGL 127SC.

ENGL 127SA American Poetry: Before 1900 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): a lower-division English course (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. A critical study of American poetry, focusing on the evolutionary and revolutionary aspects of its forms and themes. Credit is awarded for one of the following ENGL 127SA or ENGL 127A.

ENGL 127SB American Poetry From Early to Mid Twentieth-Century 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): a lower-division English course (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. A critical study of American poetry focusing on the evolutionary and revolutionary aspects of its forms and themes. Credit is awarded for one of the following ENGL 127SB or ENGL 127B.

ENGL 127SC American Poetry: Later Twentieth-Century to the Present 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): or lower-division English course (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. A critical study of American poetry focusing on the evolutionary and revolutionary aspects of its forms and themes. Credit is awarded for one of the following ENGL 127SC or ENGL 127C.

ENGL 127T Studies in American Poetry 4 Lecture, 3 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A focused study of a topic, motif, genre, period,

or movement in American poetry. Examples might include political or regional poetry, the epic or lyric, or Beat poetry or Language poetry.

ENGL 128 Major Authors 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Intensive study of a single major author. Course is repeatable as content or topic changes to a maximum of 12 units.

ENGL 129 Drama and Performance 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A critical study of selected literature focusing on the subjects of drama and performance. Course is repeatable as content or topic changes to a maximum of 12 units.

ENGL 130 Bodies and Texts of the Early Americas 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A study of cultural and political histories of the early Americas in relation to oral, written, visual, or performance-based works.

ENGL 131 Early American Literatures: Ideas of American Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines key social, political, historical, or aesthetic concepts shaping the expression and study of American literature.

ENGL 132 North American Literatures: 19th Century 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines nineteenth-century American literature and culture through literary productions from canonical novels to journalism and poetry. Includes cultural texts in the form of songs, paintings, sculpture, theater, and vaudeville. Explores contemporary discourses relating to shifting conceptions of gender, sexuality, religion, science, class, and race. Course is repeatable as content or topic changes to a maximum of 8 units.

ENGL 133 American Literature: 20th Century 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Provides a thematic, historical, formal, or critical study of modern American literature.

ENGL 134 American Literature: Twenty-First Century 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a lower-division course in English (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. Provides a thematic, historical, formal, or critical study of contemporary American literature.

ENGL 135 Modern Irish Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical study of modern Irish literature, set against the background of the political and religious conflicts of Irish history.

ENGL 136A Latinx Literatures 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or lower-division English course (other than composition); or consent of instructor. A critical survey of U.S. Latina/o/x literature. Focuses on aesthetic achievements, recurrent forms and themes, and interrelations with other American literatures. Credit is awarded for one of the following ENGL 136A or ENGL 136SA.

ENGL 136B Latinx Theatre and Performance 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or lower-division English course (other than composition); or consent of instructor. An introduction to Latinx theatre, performance art, and film from 1965 to the present. Examines the major works of playwrights and performance artists as well as important films and videos.

ENGL 136SA Latinx Literatures 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or lower-division English course (other than composition); or consent of instructor. A critical survey of U.S. Latina/o/x literature focusing on aesthetic achievements, recurrent forms and themes, and interrelations with other American literatures. Credit is awarded for one of the following ENGL 136SA or ENGL 136A.

ENGL 136T Studies in Latina and Latino Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A focused study of ideas, forms, or movements in Latina/o literature such as autobiography, growing-up narratives, popular discourses (teatro, the corrido, social movement poets), and the mainstream Latina/o literary "booms."

ENGL 137 Literatures of Displacement 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines how literature represents experiences of displacement caused by colonization, migration, state violence or civil unrest, incarceration or internment, natural or human-made disasters, and other factors. Texts may include fiction, poetry, life writing, or visual media. Includes writers and texts from one or more countries or geographical regions. Course is repeatable as content or topic changes to a maximum of 8 units.

ENGL 138A African American Literature Through the Harlem Renaissance 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical survey of African American literature with particular attention to the development of an African American literary tradition and the challenge posed to the traditional canon of American literature.

ENGL 138B African American Literature Since the Harlem Renaissance 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical survey of African American literature with particular attention to the development of an African American literary tradition and the challenge posed to the traditional canon of American literature.

ENGL 138C Literatures of the Black Diaspora 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores literature by people of African descent from the United States, Caribbean, Europe, and Africa for points of cohesion, collaboration, and contestation. Questions how Black writers challenge borders and national cultures. Studies how writing reflects and responds to Black literary inheritances.

ENGL 138T Studies in African American Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A focused study of ideas, forms, or movements in African American literature such as autobiography, conjure, the blues tradition, the Black Aesthetic, and literary vernacular.

ENGL 139 Asian American Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical survey of Asian American literature, with particular attention to aesthetic achievements, recurrent forms and themes, and interrelations with other American literatures.

ENGL 139T Studies in Asian American Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a lower-division course in English (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. A focused study of a genre, motif, or topic in Asian American literature such as poetry, autobiography, women's writing, nationalism, mobility narratives, gender, and sexuality.

ENGL 140 Special Topics in Literary Genres 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A practical and theoretical study of literary genres. Topics may include the lyric, the epic, the romance, tragedy, comedy, satire, autobiography, poetry, war literature, and children's literature. Course is repeatable as content or topic changes to a maximum of 12 units.

ENGL 141 Special Topics in Interdisciplinary Literary Studies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A critical, interdisciplinary survey of literature in relation to other areas of study.

Topics may include medical humanities, public humanities, science and technology, legal studies, archive and manuscript studies, performance studies, and visual media. Course is repeatable as content or topic changes to a maximum of 12 units.

ENGL 142 Special Topics in Cultural Studies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Covers the formal, historical, and theoretical analysis of culture in its broadest sense. Includes popular literature, the mass media, and the interplay between "low" and "high" or peasant and elite cultural forms. Topics may be drawn from any historical field. Course is repeatable as content or topic changes to a maximum of 12 units.

ENGL 143 Special Topics in Gender, Sexuality and Visual Cultures 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An intensive formal, historical, and theoretical analysis of gender and sexuality in film, television, and visual culture. Course is repeatable as content or topic changes to a maximum of 12 units. Cross-listed with MCS 143.

ENGL 144 Special Topics in Race, Ethnicity and Visual Culture 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Intensive formal, historical, and theoretical analysis of race and ethnicity in film, television, and visual culture. Course is repeatable as content or topic changes to a maximum of 12 units. Cross-listed with MCS 144.

ENGL 145 Special Topics in Film and Visual Culture 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. An intensive formal, historical, and theoretical analysis of a theme or issue in film, media, television, and visual culture. Course is repeatable as content or topic changes to a maximum of 12 units. Cross-listed with MCS 145.

ENGL 145J The Horror Film 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An intensive formal, historical, and theoretical analysis of a theme or issue in film, media, television, and visual culture. E. Hollywood in the 1960s; F. Television and American Culture; G. Film as Writing and Writing as Film; I. Liberal Hollywood and Social "Problems"; J. The Horror Film; K. African American Visual Culture; M. The Male Nude in Photography and Film. Cross-listed with MCS 145(E-Z).

ENGL 146 Special Topics in Technoculture and Computational Media 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Advanced study of theories and practices of reader and audience interaction with technologies of cultural production in general and digital media in particular. Includes praxis-oriented composition or research. Course is repeatable as content or topic changes to a maximum of 12 units. Cross-listed with MCS 146.

ENGL 147 Studies in A Major Work 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A concentrated study of a single major work from a given area of cultural production. Affords an opportunity for thorough explication of the work, exploration of historical backgrounds, and implementation of relevant critical approaches. Works include Moby Dick, Beloved, There There, No-No Boy, and The House on Mango Street. Course is repeatable as content or topic changes to a maximum of 12 units.

ENGL 149 Old English Literature 4 Lecture, 3 hours; extra reading, 3 hours. English literature of the Anglo-Saxon period: such works as Beowulf, "The Seafarer," and "The Wanderer."

ENGL 151A Middle English Literature: 1066-1500 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. An introduction to major literary genres including romance, dream vision, lyric, devotional prose, and drama.

ENGL 151B Medieval Romance 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An introduction to the literary genre of medieval romance. Texts may include stories of King Arthur and the knights of the Round Table; romances written during the religious wars known as the Crusades; global and transcultural romances; and medieval romances reimagined in contemporary film, novels, and fantasy literature.

ENGL 151C Studies in Medieval Literature 4 Lecture, 3 hours; extra reading, 4 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or lower-division English course (other than composition); or consent of instructor. Analyzes English literature of the Middle Ages. Focuses on its continental backgrounds as needed with the latter read in translation. Examines selected major literary works that illuminate topics such as Christian theology, monasticism, chivalry, and courtly love. Course is repeatable to a maximum of 8 units.

ENGL 151D Medieval Modern 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A study of connections between medieval and modern literary and cultural production. Topics may include fantasy literature and gaming; global medievalism; Middle Ages on film and television; medieval heritage politics and symbolism; race & medievalism; Gothic, neomedievalism; and modern editions, translations, and renditions of works from the Middle Ages.

ENGL 152 Renaissance Revolutions 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Studies in ideas, discoveries, and movements of the English Renaissance (1500-1660). Interrogates the notion of "the Renaissance" in its attention to literary, artistic, philosophical, scientific and/or cultural change. May focus on the development of print culture, the rise of women writers, or the formation of radical religious groups. Course is repeatable as content or topic changes to a maximum of 8 units.

ENGL 153 Studies Renaissance Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Surveys literature of the English Renaissance (1500-1660) focusing on historical and cultural contexts. May center on particular genres such as the sonnet or epic romance; examine sources in the classical or European traditions; explore the development of literary themes; or apply theoretical approaches such as ecocriticism or critical race studies. Course is repeatable as content or topic changes to a maximum of 8 units.

ENGL 154 Studies in Literatures in English, 1500-1700 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Studies in early modern literature in a British, Anglo-American, or global context. Focuses on texts produced in English colonies and Britain-beyond-England (Scotland, Wales, Ireland). Course is repeatable as content or topic changes to a maximum of 8 units.

ENGL 161 Restoration and Eighteenth-Century Literatures 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Addresses the literatures of the era. May include drama, satire, the emergence of the novel, poetry or non-fiction prose. Course is repeatable as content or topic changes to a maximum of 12 units.

ENGL 166A Literature of the Romantic Period 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): or lower-division English course (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. Covers the works of writers such as Barbauld, Blake, Coleridge, Helen Williams, Wollstonecraft, and Wordsworth. Credit is awarded for one of the following ENGL 166A or ENGL 166SA.

ENGL 166B Literature of the Romantic Period 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Covers writers such as Byron, Hazlitt, Keats, Scott, Mary Shelley, and Percy Shelley.

ENGL 166SA Literature of the Romantic Period 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): or lower-division English course (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. Covers the works of writers such as Barbauld, Blake, Coleridge, Helen Williams, Wollstonecraft, and Wordsworth. Credit is awarded for one of the following ENGL 166SA

or ENGL 166A.

ENGL 166T Studies in English Romanticism 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A study of the relationship between the literature of the period and intellectual interests such as antiquarianism, primitivism, perfectibility, transcendentalism, and organicism.

ENGL 172 Nineteenth Century British Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines nineteenth-century British literature focusing on contemporary discourses relating to shifting conceptions of gender, class, empire, race, and sexuality. Course is repeatable as content or topic changes to a maximum of 8 units.

ENGL 172T Studies in Victorian Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or lower division English course (other than composition) or consent of instructor. A study of such ideas and movements as Romanticism, Utilitarianism, the Search for Standards, Evolution, Aestheticism, the New Naturalism, and Utopian theories, organized by areas or themes, as these ideas are reflected in the literature of the age.

ENGL 176 Modernist and Postmodernist Literatures 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A thematic, formal, and socio-historical study of literature, media, performance, and art since 1900. Topics include formal innovations, authors, genres, aesthetic and political movements, war, "high" and "low" culture, and critical debates. Course is repeatable as content or topic changes to a maximum of 12 units.

ENGL 177 Cultural Politics and Community 4 Lecture, 3 hours; extra reading, 3 hours; individual study, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines literature as a mode of community formation and method for shaping political consciousness. Consists of case studies of historical moments when literature mobilizes community or political action. Specific case studies will vary. Includes contemporary and historical examples. Course is repeatable as content or topic changes to a maximum of 12 units.

ENGL 179A History of Speculative Fiction 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or lower-division English course (other than composition); or consent of instructor. A historical survey of speculative fiction literature from the nineteenth century to the present. Credit is awarded for one of the following ENGL 179A or ENGL 179SA.

ENGL 179B Studies in Speculative Fiction 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a lower-division course in English (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. Focuses on a specific theme, subgenre, period, movement, or major author within the field of speculative fiction.

ENGL 179C Screen Speculative Fiction 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): a lower-division course in English (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. A historical survey of speculative fiction film and television from the twentieth century to the present. Includes readings in film and television criticism. Course is repeatable to a maximum of 8 units. Credit is awarded to a maximum of 10 units for either or both ENGL 179C or ENGL 179SC.

ENGL 179D Science Fiction Worldbuilding and Everyday Life 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines science fiction as a window into political thought and movements for social change. Topics include utopia and dystopia, bodily autonomy, experimental art, and ecology.

ENGL 179SA History of Speculative Fiction 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or lower-division English course (other than composition); or consent of instructor. A historical survey of speculative fiction literature from the nineteenth century to the present. Credit is awarded for one of the following ENGL 179SA or ENGL 179A.

ENGL 179SC Screen Speculative Fiction 5 Lecture, 3 hours; discussion, 1 hour; screening, 2 hours; extra reading, 2 hours. Prerequisite(s): a lower-division course in English (other than composition); restricted to class level standing of junior, or senior; or consent of instructor. A historical survey of speculative fiction film and television from the twentieth century to the present. Includes readings in film and television criticism. Course is repeatable to a maximum of 10 units. Credit is awarded to a maximum of 10 units for either or both ENGL 179C or ENGL 179SC.

ENGL 182 Topics in Television Genres 4 Lecture, 3 hours; screening, 3 hours; extra reading, 3 hours; written work, 3 hours. Prerequisite(s): MCS 015. An in-depth analysis of a selected television genre. May include history of the specific genre across time periods or may focus on a specific time period. Combines screenings of episodes and scholarly readings about the medium. Topics include aesthetics, political economy, and cultural critique. Course is repeatable as content or topic changes to a maximum of 8 units. Cross-listed with MCS 182.

ENGL 183 Special Topics in Television Culture 4 Lecture, 3 hours; written work, 3 hours; screening, 3 hours; extra reading, 3 hours. Prerequisite(s): MCS 015; or equivalent. Provides a comprehensive introduction to a particular debate in television studies. Topics vary with each offering and may include politics of representation; broadcast, cable and streaming; and in-depth analysis of a specific series. Combines historical with aesthetic approaches. Integrates screenings of episodes with scholarly readings. Course is repeatable as content or topic changes to a maximum of 8 units. Cross-listed with MCS 183.

ENGL 184 Narrative Television 5 Lecture, 3 hours; screening, 5 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. A study of the narrative capacities of television as a medium. Focuses on form and storytelling structure. May include multiple genres of television production including drama, sports, news, and reality. Emphasizes the relationship between medium and plot in historical and national frameworks. Course is repeatable as content or topic changes to a maximum of 15 units.

ENGL 186 Intersectional Feminist Theory and Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the theory, literature, and expressive cultures of one or more groups of Black, Indigenous, and women of color. Focuses on critically interpreting narratives as they are shaped by historical, social, and cultural contexts and intersecting systems of power. Course is repeatable as content or topic changes to a maximum of 8 units.

ENGL 187 Literature and Economics 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores the intersections of literature and economics. May focus on a specific historical period. Topics range from medieval ideas about moral economies to Victorian political economy, to the relation between 20th/21st century writing and financialization.

ENGL 188 English Capstone: Literature and the Professions 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): ENGL 102 with a grade of C or better or ENGL 102W with a grade of C or better; restricted to class level standing of junior, or senior; restricted to major(s) English; or consent of instructor. Studies of literature about or in relation to a profession.

ENGL 189 English Capstone Seminar 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): ENGL 102 or ENGL 102W. Advanced undergraduate study of a specific topic proposed by instructor.

ENGL 190 Special Studies 1 to 5 To be taken with the consent of the Chair of the department as a means of meeting special curricular problems.

ENGL 196 Senior Research Paper 1 to 4 Research, 3 to 12 hours. Prerequisites: ENGL 189. A continuation of the research project begun in ENGL 189. Conducted under the supervision of a faculty advisor in the applicable field of study.

ENGL 198 R'course - Variable Topics 1 Activity hours vary per R'Course proposal. Prerequisite(s): permission needed from department. An opportunity for UCR undergraduate students to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original course topics are variable and unique from other departmental course offerings, designed to highlight the student facilitators' expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

ENGL 198I Individual Internship in English 1 to 12 Internship, 3 to 36, Prerequisite(s): consent of instructor or upper division standing. Introduces the operations of professional societies, journals, archives, and cooperating agencies related to the study and management of literature and language. Explores the ongoing operations of these organizations. Includes researching and writing analyses and/or histories under faculty supervision. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

Graduate Courses

ENGL 200 Introduction to Graduate Study in English 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A team-taught introduction to a range of critical and theoretical issues of concern to entering graduate students, including canon formation, field organization, critical and theoretical assumptions behind the establishment of various fields, and the uses of theory.

ENGL 246 Seminar in Digital Media and Technocultural Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the history, theories, and practices of technoculture. Includes studies of computational or combinatorial texts and media. Brings together issues and contexts related to technological innovation, including the industrial production, refraction in aesthetic practices or popular cultural texts and sociopolitical deployment. Course is repeatable as content changes.

ENGL 247 Seminar in Science, Literature and Media 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Combines perspectives from the cultural study of technology and the social study of science with an analysis of the cultural texts. Includes readings from significant primary texts alongside work from the history of science, technology, and medicine. Course is repeatable to a maximum of 16 units.

ENGL 248 Seminar in Science Fiction 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive research in the history and theory of science fiction. Includes readings of significant primary texts and examinations of the genre from various critical perspectives (e.g. structuralist, Marxist, feminist). Course is repeatable to a maximum of 16 units.

ENGL 250 Seminar in Native American Literary and Cultural Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Enlists questions that lie in between literary and visual culture texts and the broader, unwritten discourses surrounding Indigenous representations in film and visual culture. Explores questions of how Indigenous literature and visual culture engage with issues of settler colonialism, gender, race, sexuality, class, and nation. Course is repeatable to a maximum of 16 units.

ENGL 251 Seminar in Black Literary and Cultural Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Analyzes black literary and cultural expression within a framework of interdisciplinary black studies and literary and cultural theory. Examines the ways in which African American literature and/or the literatures of the African diaspora engage the histories of slavery, colonization, and freedom-making in the black Atlantic world. Course is repeatable to a maximum of 16 units.

ENGL 252 Seminar On Latinidades 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on Latinidades shifting the study of Latina/o literature toward comparative, transnational, and situational approaches and theories. Latinidades expands the national, geographical, and political borders of Latina/o literature, allowing the narratives and texts that constitute ethnic-specific structures of the field to be reimagined. Course is repeatable to a maximum of 16 units.

ENGL 253 Seminar in Asian/American Literary and Cultural Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on Asian American literary and cultural production within a framework of Asian American, diasporic, and transpacific theory. Examines how Asian American literature engages dominant models of gender, race, class, sexuality, and nation in conjunction with the specific histories of the several ethnic groups that comprise Asian America and the Asian diaspora. Course is repeatable to a maximum of 16 units.

ENGL 260 Seminar in Medieval Literature 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive research in medieval literature. May focus on major authors, including Chaucer, Langland, or the Gawain -poet; genres, including romance, prose, or the drama; thematic topics, including gender, literacy, or subjectivity; or methodology, including textual study, historicism, or literary theory. Course is repeatable as content changes.

ENGL 262 Seminar in Renaissance Literature 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Studies in Renaissance literature and its literary, cultural, or historical contexts. Intensive readings in a major author, historical subperiod, or special topic. Includes critical and theoretical approaches important to the field. Course is repeatable as content changes.

ENGL 264 Seminar in Restoration and Eighteenth-Century Literature 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive research in particular areas of Restoration and eighteenth-century literature and society such as the "rise" of the novel; women writers and readers; interactions of "high" and "low" cultures; ideologies of gender and sexuality; capitalism, colonialism, and literature; autobiographical and historical representations of self and others. Course is repeatable as content changes.

ENGL 265 Seminar in Romantic Literature 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Research in late eighteenth- and early nineteenth-century literature and its legacy in modern critical configurations of romanticism. Course is repeatable as content changes.

ENGL 267 Seminar in Victorian Literature 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Concentrated research and discussion of topics, issues, and figures in Victorian literature and culture. Rubrics may include, but are not limited to, theoretical approaches to Victorian studies; questions of race, class, gender, and sexuality in Victorian culture; problems of aesthetics and genre; the politics of Empire; as well as author or text focused offerings. Course is repeatable as content changes.

ENGL 268 Seminar in British Literature Since 1900 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive analysis of figures, genres, movements, and issues in twentieth-century British literature and culture. May include topics such as Bloomsbury and the Politics of art; Joyce and Empire; Modernism, Modernity, and Gay Identities; British Postmodernism; Virginia Woolf and Feminist Theory. Course is repeatable as content changes.

ENGL 269 Seminar in American Literature to 1900 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive research in American literature and culture to 1900. Topics may include nineteenth-century novel; slavery and narrative; gender and colonial literary culture; Whitman and Dickinson; or other historical, gender-centered or theoretical issues. Course is repeatable as content changes.

ENGL 270 Seminar in American Literature Since 1900 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Study of representative literary texts and of current theories about the field. May focus on such topics as Modernism, Postmodernism, regionalism, alternative canons, interrelations among texts, and connections between texts and cultures.

Course is repeatable as content changes.

ENGL 272 Seminar in Critical Theory 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Studies in theoretical movements. May emphasize historical or thematic relations among various theoreticians. Course is repeatable as content changes.

ENGL 273 Seminar in Cultural Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive formal, historical, and theoretical research into the history and theory of culture in its broadest sense: popular literature, the mass media, and the interplay between peasant and elite or "low" and "high" cultural forms. Course is repeatable as content changes.

ENGL 274 Seminar in Feminist Discourses 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on theories and histories of gender and sexuality and analyzes the effects, in literary and other discourses, of foregrounding these categories. May involve special emphasis on "women" as writers and theorists and/or on feminist issues. Course is repeatable as content changes.

ENGL 275 Seminar in Film and Visual Cultures 4 Seminar, 3 hours; screening, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Analysis of film, television, and other forms of visually-oriented textuality. Approaches may include cultural criticism; media theory; structural and poststructural analysis; feminist, gender, gay and lesbian theory; semiotics. Course is repeatable as content changes.

ENGL 276 Seminar in Colonialism and Postcoloniality 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the analysis of colonial discourse and the postcolonial condition. Issues addressed include, among others, historiography and subalternity; nationalism, gender, and sexuality; neocolonialism and transnationality; theorizing resistance; mimicry in colonial discourse; the academy, pedagogy, and the postcolonial intellectual. Course is repeatable as content changes.

ENGL 277 Seminar in Sexualities and Genders 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines representations in a variety of literary, media, and critical genres by or of lesbians, gay men, transgenders, and others marginalized because of their sexuality or gender expression. Topics may include the history of sexuality, camp, posthuman genders and sexualities, queer theory, and lesbian and gay literature and film. Course is repeatable as content changes.

ENGL 278 Seminar in Minority Discourse 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Intensive study and research in cultural traditions formerly excluded from literary history, such as African American, Asian American, Chicano, and Native American. Includes cross-cultural studies in the representations of such marginalized groups. Topics may include the African American novel; border culture; nineteenth-century Black bodies; oral history, and literature. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content or topic changes. Cross-listed with MCS 278.

ENGL 279 Seminar in Rhetorical Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive research and study in rhetoric or composition theory. Topics may include the rhetorical dimensions of literature, literary theory, and civic discourse; the ethics or history of rhetoric; competing conceptions of the writing process; and the relations between rhetorical, literary, and cultural criticisms. Course is repeatable as content changes.

ENGL 280 Colloquium in English and American Literature 2 Seminar, 2 hours. Prerequisite(s): graduate standing. Colloquia of both a formal and informal order on current research topics for students, faculty, and visiting scholars. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

ENGL 281 Seminar in Comparative Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive study of two or more ostensibly distinct fields, periods, disciplines, or arts. Course is repeatable as content changes

ENGL 282 Seminar in Bibliography and Textual Criticism 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced research in the history of the book and textual production, including such topics as analytical bibliography, editorial theory and practice, and the economics of textual dissemination. Course is repeatable as content changes.

ENGL 289 Seminar in Genres 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines individual literary genres (poetry, the novel, drama, etc.) and subgenres (epic, romance, lyric, comedy, etc.) in terms of current or historical genre theories. Course is repeatable as content changes.

ENGL 290 Directed Studies 1 to 4 Consultation,1 to 3 hours; individual study, 12 hours. Prerequisite(s): consent of instructor and graduate advisor. Advanced research study culminating in written work. course is repeatable.

ENGL 291 Individual Study in Coordinated Areas 1 to 12 Outside research, variable, Prerequisite(s): graduate standing. A program of study designed to advise and assist candidates who are preparing for examinations. Repeatable under the following rules: (1) a student may take up to 12 units prior to the award of the M.A.; (2) a student may take up to 24 additional units after award of the M.A. but prior to successful completion of the Ph.D. qualifying examination. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

ENGL 292 Concurrent Analytical Studies 1 to 4 Research, 3 to 12 hours. Prerequisite(s): instructor approval, or approval of instructor in the field under whom the work will be carried out. Each 292 course will be taken concurrently with some 100 series course but on an individual basis. It will be devoted to research, criticism, and written work of a graduate order commensurate in amount with the number of units elected. ENGL 101 and ENGL 103 may not be used for this arrangement. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

ENGL 296 Master's Portfolio 2 Research, 6 hours; consultation, 2 to 3 hours. Prerequisite(s): completion of five quarters of master's study in English; consent of the Graduate Advisor. Students revise, extend, and develop essays written during their master's program in preparation for the master's portfolio examination. Graded Satisfactory (S) or No Credit (NC).

ENGL 297 Directed Research 1 to 6 Research, 3 to 18 hours., Prerequisite(s): graduate standing or consent of instructor. Individual research by graduate students directed by a particular faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENGL 298I Individual Internship 1 to 12 Term paper, 1 to 6 hours; extra reading, 1 to 6 hours; internship, 1 to 24 hours. Prerequisite(s): graduate standing; and consent of instructor. Individual study or apprenticeship in a professional setting such as a Library, Museum, Archive, or Media and Arts Organization to gain practical experience and skills for future career. The number of units enrolled will depend upon the amount of internship hours per week. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

ENGL 299 Research For Thesis Or Dissertation 1 to 12 Thesis, 3 to 36 hours. Prerequisite(s): graduate standing or consent of instructor. Research, under the direction of a faculty member, for preparation of the thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable; students may enroll in a maximum of 12 units per quarter.

Professional Courses

ENGL 301 Introduction to the Teaching of English 1 Individual and group conferences, 1 hour. Prerequisite(s): graduate standing. A flexible program of meetings and workshops specifically devoted to orienting apprentices and transfer TAs to the writing program at UC Riverside. Concentrates on the problem of organizing and teaching ENGL 001A, ENGL 001B, and ENGL 001C or its equivalent. Required of all apprentices and transfer TAs. Students must enroll concurrently in ENGL 302. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit for a maximum of 2 units.

ENGL 302 Teaching Practicum 1 to 4 Seminar, 1 to 4 hours. Prerequisite(s): graduate standing. A flexible program of meetings and conferences on the problems and techniques of writing instruction most pertinent to Basic Writing or to ENGL 001. Required of all TAs for at least five quarters, after which the TA may, with the permission of the Director of ENGL 001, elect to take ENGL 304 instead. Open to all graduate students. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

ENGL 303 Advanced Teaching Practicum 1 to 2 Discussion, 1 hour; practicum, 1 to 3 hours. Prerequisite(s): graduate standing or consent of instructor. A flexible program of meetings and conferences on the problems and techniques of teaching literature, cultural studies, film studies, and related courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENGL 304 Professional Research Preparations 4 Seminar, 3 hours; research, 3 hours; consultation, 5 hours. Prerequisite(s): consent of instructor. Covers the procedures, preparation, and presentation of oral and written research materials, including prospectus, with individual direction from instructor. Graded Satisfactory (S) or No Credit (NC).

ENGL 380 The Teaching of Written Composition 4 Seminar, 8 hours. Prerequisite(s): consent of instructor; participation in the Inland Area Writing Project Summer Workshop. A study of research and practice in the teaching of written composition in the elementary and secondary schools. Offered in summer only. Students may receive either a letter grade or Satisfactory (S) or No Credit (NC) grade. See instructor for grading basis; no petition is required.

ENGL 381 Preparing to Teach Teachers 1 to 4 Seminar, 2 to 8 hours. Prerequisite(s): consent of instructor; concurrent enrollment in ENGL 380. Participation in the Inland Area Writing Project Summer Workshop. Preparation and presentation of inquiry projects. Emphasis on inquiry into pedagogical assumptions and the way they contribute to expert teaching practices. Offered in summer only. Students may receive either a letter grade or Satisfactory (S) or No Credit (NC) grade. See instructor for grading basis; no petition is required.

ENGL 410 Seminar in Professional Development 2 Workshop, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Provides a flexible program of meetings and workshops on the development of skills and practices of the professional literary scholar. Includes conference presentations, academic publishing, pedagogy, grant writing, and other career-building practices. Graded Satisfactory (S) or No Credit (NC). course is repeatable to a maximum of 6 units.

Entomology

Subject abbreviation: ENTM
College of Natural and Agricultural Sciences

Christiane Weirauch, Ph.D., Chair
Erin Wilson Rankin, Ph.D., Vice Chair
Department Office, 175 Entomology
insects.ucr.edu

Graduate Student Affairs
(800) 735-0717 or (951) 827-1106
insects.ucr.edu/graduate-studies-program

Undergraduate Academic Advisor
(951) 827-4186
insects.ucr.edu/undergrad-programs

Professors

Michael E. Adams, Ph.D., *Distinguished Professor, Entomology/Molecular, Cell and Systems Biology*
Peter W. Atkinson, Ph.D.
Boris Baer, Ph.D.
Dong-Hwan Choe, Ph.D.
Brian A. Federici, Ph.D., *Distinguished Professor of Graduate Division*
Alec Gerry, Ph.D.
John M. Heraty, Ph.D.
Chow-Yang Lee, Ph.D., *Endowed Chair in Urban Entomology*
Quinn McFrederick, Ph.D.
Jessica Purcell, Ph.D.
Richard A. Redak, Ph.D.
Michael K. Rust, Ph.D., *Distinguished Professor of Graduate Division*
John T. Trumble, Ph.D., *Distinguished Professor of Graduate Division*
Christiane Weirauch, Ph.D.
Erin Wilson Rankin, Ph.D.
Naoki Yamanaka, Ph.D.

Professors Emeriti

Thomas S. Bellows, Jr., Ph.D.
Ring T. Cardé, Ph.D.
Elizabeth Grafton-Cardwell, Ph.D.
J. Daniel Hare, Ph.D.
E. Fred Legner, Ph.D.
Jocelyn G. Millar, Ph.D.
Thomas A. Miller, Ph.D.
Joseph G. Morse, Ph.D.
Bradley Mullens, Ph.D.
Timothy D. Paine, Ph.D.
Thomas M. Perring, Ph.D.
John D. Pinto, Ph.D.
Alexander Raikhel, Ph.D.
Richard Stouthamer, Ph.D.
S. Nelson Thompson, Ph.D.
P. Kirk Visscher, Ph.D.
Gregory P. Walker, Ph.D.

Associate Professors

Allison Hansen, Ph.D.
Kerry Mauck, Ph.D., *Alfred M. Boyce Chair in Entomology*
Hollis Woodard, Ph.D.

Assistant Professors

Karthikeyan Chandrasegaran, Ph.D.
Luciano Cosme, Ph.D.
Ysabel Giraldo, Ph.D.
Zachary MacDonald, Ph.D.
Amy Murillo, Ph.D.
Ikju Park, Ph.D.
Elizabeth Rowen, Ph.D.
Morgan Thompson, Ph.D.

**

Professors of Cooperative Extension

Bodil, Cass, Ph.D.
Matthew Daugherty, Ph.D.
Mark Hoddle, Ph.D., *Distinguished Professor of Cooperative Extension*
S. Houston Wilson, Ph.D.

Cooperating Faculty

Kurt Anderson, Ph.D., *Evolution, Ecology, and Organismal Biology*
Alan Brelsford, Ph.D., *Evolution, Ecology, and Organismal Biology*
Marko J. Spasojevic, Ph.D. *Evolution, Ecology and Organismal Biology*
Linda Walling, Ph.D, *Botany and Plant Sciences*

Major

The Department of Entomology offers undergraduate programs leading to either the B.S. or the B.A. degree. The B.S. degree offers students with a strong interest in the natural sciences an opportunity to emphasize this aspect of their education. The B.A. degree is available to students who wish to obtain a broader background in the humanities and social sciences than is required of students in the B.S. program.

The department offers six concentrations to choose from: General Insect Biology, Medical, Public Health and Epidemiology, Insect Molecular Biology and Genomics, Conservation, Ecology and Evolution, Applied Entomology/Pest Management, and Science Education. All students majoring in Entomology are normally required to take the core curriculum.

Information on the programs and course requirements is available at CNAS Academic Advising Center, 1223 Pierce Hall. Counseling, course recommendations, and information on education and career goals are provided by the Undergraduate Faculty Advisors, Dr. Allison Hansen, 224 Entomology and Dr. John Heraty, 138 Entomology.

Transfer Selection Criteria

Applicants to majors in the College of Natural and Agricultural Sciences are selected on the basis of academic preparation, as assessed by their GPA and the strength of preparation for the intended major. A GPA of at least 2.70 is required. (This is a baseline GPA for consideration and not a guarantee of admission.) The GPA cutoff for Transfer admissions will be set each year by the appropriate Divisional Dean in consultation with the Executive Committee and the Chairs, and may differ by program depending on Transfer enrollment capacity.

In addition, applicants will need to complete college courses comparable to (articulated to) the following list of UCR courses to meet selection criteria for this major. Courses must

be completed with "C" grades or better.

1. BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C
2. CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, CHEM 01LC
3. MATH 005B or MATH 007A or MATH 009A

Final placement into required calculus classes will depend on class articulations.

To ensure graduation within four years, potential applicants are also encouraged to complete college courses comparable to (articulated to) the following UCR courses. These courses are not required to transfer into the major but are requirements for the major. Courses must be completed with "C" grades or better.

1. STAT 010
2. PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB, PHYS 002C, PHYS 02LC (must be calculus-based)
3. CHEM 008A CHEM 08LA, CHEM 008B, CHEM 08LB, CHEM 008C, CHEM 08LC
4. MATH 005C or MATH 007B or MATH 009B

Students should visit assist.org for updated and comprehensive major preparation requirements.

3. Organic chemistry (one-year lower-division), each course completed with a grade of "C" or better
4. PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB PHYS 002C, and PHYS 02LC
5. PHYS 040A, PHYS 040B, and PHYS 040C
6. MATH 009C, MATH 010A, MATH 010B, and MATH 046

Courses must be completed with a letter grade, with no grade lower than a "C."

Students should visit **assist.org** for updated and comprehensive major preparation requirements.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

Major Requirements

The major requirements for both the B.A. and the B.S. degrees in Entomology are as follows:

1. Lower-division core requirements (40 units)
   a) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C
   b) MATH 005B or MATH 007A or MATH 009A or MATH 09HA
   c) MATH 005C or MATH 007B or MATH 009B or MATH 09HB
   d) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
   e) STAT 010
2. Upper-division core requirements (18 units)
   a) ENTM 100/BIOL 100, ENTM 107, ENTM 180, and 4 units in any combination of ENTM 190, ENTM 197, ENTM 199, or ENTM 199H
   b) BIOL 102

General Insect Biology Concentration

1. Lower-division requirements (23 units)
   a) CHEM 008A or CHEM 08HA, CHEM 08LA or CHEM 08HLA, CHEM 008B or CHEM 08HB, CHEM 08LB or CHEM 08HLB
   b) PHYS 002A or PHYS 02HA, PHYS 02LA or PHYS 02HLA, PHYS 002B or PHYS 02HB, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC
2. Upper-division requirements (28 units)
   a) ENTM 173/BIOL 173
   b) BIOL 107A
   c) BCH 100 or BCH 100H
   d) Sixteen (16) additional units of entomology electives, which may include up to 2 additional units of ENTM 190, ENTM 197, ENTM 199 or ENTM 199H.

Medical, Public Health & Epidemiology Concentration

1. Lower-division requirements (23 units)
   a) CHEM 008A or CHEM 08HA, CHEM 08LA or CHEM 08HLA, CHEM 008B or CHEM 08HB, CHEM 08LB or CHEM 08HLB
   b) PHYS 002A or PHYS 02HA, PHYS 02LA or PHYS 02HLA, PHYS 002B or PHYS 02HB, PHYS 02LB or PHYS 02HLB, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC
2. Upper-division requirements (28 units)
   a) ENTM 173/BIOL 173
   b) BIOL 107A
   c) BCH 100 or BCH 100H
   d) Sixteen (16) additional units of Entomology electives from the following courses: ENTM 101, ENTM 111, ENTM 114, ENTM 123, ENTM 125/ENTX 125/PLPA 125, ENTM 126, ENTM 133, ENTM 154/BIOL 154, BIOL 128, BIOL 157, BIOL 158: which may include up to 2 additional units of ENTM 190, ENTM 197, ENTM 199 or ENTM 199H.

Insect Molecular Biology & Genomics Concentration

1. Lower-division requirements (23 units)
   a) CHEM 008A or CHEM 08HA, CHEM 08LA or CHEM 08HLA, CHEM 008B or CHEM 08HB, CHEM 08LB or CHEM 08HLB
   b) PHYS 002A or PHYS 02HA, PHYS 02LA or PHYS 02HLA, PHYS 002B or PHYS 02HB, PHYS 02LB or PHYS 02HLB, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC
2. Upper-division requirements (28 units)
   a) ENTM 173/BIOL 173
   b) BIOL 107A
   c) BCH 100 or BCH 100H
   d) Sixteen (16) additional units of Entomology electives from the following courses: ENTM 101, ENTM 106, ENTM 111, ENTM 112/BIOL 112/BPSC 112, ENTM 123, ENTM 125/ENTX 125/PLPA 125, ENTM 126, BIOL 118, BIOL 121, BIOL 128, GNBT 110, GNBT 114; which may include up to two (2) additional units of ENTM 190, ENTM 197, ENTM 199 or ENTM 199H.

Conservation, Ecology & Evolution Concentration

1. Lower-division requirements (17-18 units)
   a) CHEM 008A or CHEM 08HA, CHEM 08LA or CHEM 08HLA, CHEM 008B or CHEM 08HB, CHEM 08LB or CHEM 08HLB
   b) PHYS 002A or PHYS 02HA, PHYS 02LA or PHYS 02HLA, and either PHYS 002B or PHYS 02HB, and PHYS 02LB OR PHYS 02HLB; or PHYS 008
2. Upper-division requirements (24 units)
   a) ENTM 173/BIOL 173
   b) BCH 100 or BCH 100H
   c) Sixteen (16) additional units of Entomology electives from the following courses: ENTM 101, ENTM 106, ENTM 108, ENTM 109, ENTM 112/BIO 112/BPSC 112, ENTM 114, ENTM 123, ENTM 127/BIOL 127, ENTM 130, ENTM 133, ENTM 139/MCBL 139, ENTM 162/BIOL 162, BIOL 151, BIOL 166; which may include up to two (2) additional units of ENTM 190, entm 197, ENTM 199 OR ENTM 199H.

Applied Entomology/Pest Management Concentration

1. Lower-division requirements (17-18 units)
   a) CHEM 008A or CHEM 08HA, CHEM 08LA or CHEM 08HLA, CHEM 008B or CHEM 08HB, CHEM 08LB or CHEM 08HLB
   b) PHYS 002A or PHYS 02HA, PHYS 02LA or PHYS 02HLA, and either PHYS 002B or PHYS 02HB, and PHYS 02LB or PHYS 02HLB; or PHYS 008
2. Upper-division requirements (24 units)
   a) ENTM 173/BIOL 173
   b) BIOL 100 or BCH 100H
   c) Sixteen (16) additional units of Entomology electives from the following courses: ENTM 106, ENTM 112/BIOL 112/BPSC 112, ENTM 114, ENTM 123, ENTM 124, ENTM 125/ENTX 125/PLPA 125, ENTM 126, ENTM 128, ENTM 129, ENTM 130, ENTM 133; which may include up to two (2) additional units of ENTM 190, ENTM 197, ENTM 199 or ENTM 199H.

Science Education Concentration

Students must consult with their Entomology advisor before electing this option.

1. Lower-division requirements (4-5 units)
   a) One of PHYS 008 or PHYS 010 or (PHYS 002A or PHYS 02HA, PHYS 02LA or PHYS 02HLA)
2. Upper-division requirements (32 units)
   a) EDUC 132, EDUC 147, EDUC 178, EDUC 179A
   b) Sixteen (16) additional units of Entomology electives, which may include up to 2 additional units of ENTM 190, ENTM 197, ENTM 199 or ENTM 199H.

For lower-division students interested in pursuing the Science Education Concentration in

Entomology, EDUC 001 is recommended.

Upper division courses in BIOL, BPSC, and related programs including but not limited to BIOL 151 and BPSC 133 are suggested to acquire a background in the life sciences appropriate for an Entomology major.

For students intending to specialize at the graduate level in insect toxicology or insect physiology, biochemistry, and molecular biology, it is recommended that BCH 110A, BCH 110B, and BCH 110C sequence and BCH 102 be substituted in place of an equal number of upper-division course units in life sciences. Due to course context overlap, credit is not awarded for BCH 110A, BCH 110B, or BCH 110C if it has already been awarded for BCH 100

Minor

The Department of Entomology offers a minor in Entomology designed to allow the student the freedom to pursue areas of particular interest.

The minor consists of no less than 20 and no more than 28 units of Entomology courses to be selected as follows:

1. ENTM 100/BIOL 100
2. Select from the following upper-division Entomology courses to complete unit requirement: ENTM 106, ENTM 107, ENTM 109, ENTM 112/BIOL 112/BPSC 112, ENTM 114, ENTM 124, ENTM 125, ENTM 126, ENTM 127/BIOL 127, ENTM 129, ENTM 129L, ENTM 133, ENTM 154, ENTM 162/BIOL 162, ENTM 173/BIOL 173, ENTM 180, ENTM 190, ENTM 197, ENTM 199, ENTM 199H
3. No more than 4 units of ENTM 190, ENTM 197, ENTM 199, or ENTM 199H, either solely or in combination, may be applied toward the unit requirement.
4. Of the specified upper-division units, a minimum of 16 must be unique to the minor and may not be used to satisfy major requirements.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Combined Entomology B.S. + Entomology M.S. Program

The College of Natural and Agricultural Science offers a combined five-year B.S.+M.S. program in Entomology, designed to allow successful UCR Entomology B.S. graduates to complete the Master of Science degree in Entomology in one year (Plan I, Thesis).

Applicants to the Combined Entomology B.S.+M.S. program (including transfer students) should apply by the end of their junior year, providing that the student is a UCR Entomology B.S. student with cumulative GPA at least 3.0 overall and 3.3 GPA in the Entomology major. The application to the Combined B.S.+M.S. program must include a Statement of Interest and Eligibility, at least two recommendation letters from UCR Academic Senate faculty members, one of which should include the prospective thesis advisor and at least one of which must be Entomology faculty. Matriculation into the graduate portion of the combined degree program occurs in the Fall term following senior year, provided: (a) the M.S. application is accepted, (b) throughout senior year, the student is an Entomology B.S. major with cumulative GPA 3.0 or higher, (c) by the end of senior year, the student completes the Entomology B.S. degree requirements.

Incoming freshman students who apply to the Entomology B.S. program may simultaneously apply for preliminary admission into the combined degree program provided their high-school GPA is at least 3.6, they satisfy the Entry-Level Writing requirement prior to matriculation, and they have sufficient math preparation to enroll in MATH 7A (Calculus for the Life Sciences) or 9A (First-Year Calculus Part 1) upon arrival. Preliminary conditional admission status is maintained as long as the student is an Entomology B.S. student in good standing with a cumulative GPA of at least 3.0. Conditionally admitted students still need to apply for full admission by the end of their junior year as described above.

Overall Requirements

A total of 36 units are required to complete the MS portion. 24 units must be 200-level. No more than 12 units may come from 297 or 299 research units. No more than 12 units of ENTM 100-level courses earned prior to matriculation to graduate status can be applied toward the MS degree requirements.

Course Requirements

1. While in the Combined Entomology B.S.+M.S. Program, students must complete a minimum of 24 units of research (a combination of ENTM 190/197/199 and ENTM 297/299) over 6 consecutive quarters. Students receive credit towards this requirement by completing up to 12 units of ENTM 190/197/199/199H as an undergraduate student and a minimum of 12 units of ENTM 297/299 as a graduate student. Only 12 units of ENTM 297/299 will count toward the 36 unit requirement.
2. A minimum of 9 units of graduate courses and/or graded 2-unit graduate seminars from this list of courses: ENTM 201, ENTM 201L,
   ENTM 202, ENTM 202L, ENTM 203, ENTM 203L, ENTM 210, ENTM 211, ENTM 212, ENTM 219, ENTM 227, ENTM 229, ENTM 230, ENTM 240, ENTM 241, ENTM 242, ENTM 249, ENTM 251, ENTM 252, ENTM 253, ENTM 254, ENTM 255, ENTM 256, ENTM 257, ENTM 258, ENTM 259, ENTM 260, ENTM 262, ENTM 271, ENTM 272, ENTM 276, ENTM 277, ENTM 289, ENTM 290, ENTM 423, BPSC 230, BPSC 234, BPSC 246, BPSC 247, EEOB 215, EEOB 217,
   EEOB 230, EEOB 282, EEOB 283, STAT 231A, STAT 231B.
3. Up to 6 units of upper division 100 level ENTM courses may be taken during the M.S. portion of the program.
4. Enrollment in ENTM 250, is required during all quarters of M.S. study (3 units total).
5. Thesis and Final Oral Examination: Following completion of their research, students submit a written thesis and conclude their studies with an oral public defense of the thesis.

Interested students should check with the Department of Entomology's Undergraduate Advisors and their Academic Advisor for additional details.

Professional Development

Students in the Entomology B.S.+M.S. Program must participate in the departmental seminar (ENTM 250) for the three quarters of their master's year and present at the Annual Graduate Student Seminar Day.

Graduate Program

The Department of Entomology offers programs leading to the M.S. (thesis plan) and Ph.D. degrees with specialization in, but not restricted to, the following areas of study:

- Arthropod vectors of human, animal, and plant pathogens
- Behavior
- Biochemistry and Physiology
- Chemical Ecology
- Conservation Biology and Global Change
- Endocrinology and Development
- Ecology and Evolution
- Genetics, Genomics, and Molecular Biology
- Insect Pathology
- Integrated Pest Management
- Invasive Species and Biological Control
- Medical and Veterinary Entomology
- Nematology
- Neuroscience
- Plant-Herbivore Interactions
- Social Insects and Pollination Biology
- Systematics
- Urban Entomology

Information on participating faculty and their research specializations may be found at insects.ucr.edu. University requirements for the M.S. and Ph.D. degrees are given in the Graduate Studies section of this catalog.

Admission

For admission to the graduate program, prospective applicants must have a bachelor's degree with a major in Entomology, a biological science, Chemistry, Biochemistry, or a suitable equivalent. Regardless of undergraduate major, students must have strength in life sciences. Recommended (but not required for admission) courses vary depending on research focus and include biochemistry, chemistry and organic chemistry, data sciences, entomology, genetics, physics, statistics and other courses specific to research areas.

Credit from these courses does not count toward the unit requirement of the M.S. degree.

All applicants whose first language is not English and do not have an undergraduate or graduate degree from an accredited institution where English is the exclusive language of instruction are required to provide a valid and passing English Proficiency exam score. Overall minimum scores are: TOEFL: 80 (iBT); 550 for pBT. IELTS: overall score of 7.0, with no individual component score less than 6.0.

Course Work
All students must take ENTM 201, ENTM 201L, ENTM 202, ENTM 202L, ENTM 203, and ENTM 203L (15 units).

Seminar Requirements

1. All full-time students must enroll in the ENTM 250 seminar during each quarter in which it is offered. (units vary)
2. Students in the second year and beyond must present a seminar or a poster presentation of their research at the Annual Graduate Student Seminar Day.

Professional Development

Entomology students must complete an annual Individual Development Plan along with their annual progress report and present an annual seminar or poster presentation covering their research investigations at the Annual Graduate Student Seminar Day, and complete ENTM 201, ENTM 202, and ENTM 203.

Doctoral Degree

Each student, with the advice of their Ph.D. Guidance Committee, will select courses that complement their research program and help the student prepare for the qualifying examination (units vary).

Students must take at least four Entomology 2-unit seminar courses for a letter grade from the following list: ENTM 249, ENTM 251, ENTM 252, ENTM 253, ENTM 254, ENTM 255, ENTM 256, ENTM 257, ENTM 258, ENTM 259, ENTM 260, ENTM 262, ENTM 289, ENTM 423 (8 units).

Written and Oral Qualifying Examinations
Advancement to candidacy depends on the student passing written and oral qualifying examinations.

Dissertation and Final Oral Examinations
Following completion of their research, students submit a written dissertation and conclude their studies with an oral public defense of the dissertation.

Exam Modality
In-person is the default modality for qualifying exams and final defenses. If unforeseen circumstances arise and the exam committee chair approves, a hybrid exam will be allowed. If a hybrid exam is approved, committee members not based at the UC Riverside campus may attend remotely but the majority of committee members must be physically present (e.g. 2 out of 3 for the final defense, 3 out of 5 for the qualifying exam). The exam committee chair and the student are required to be physically present.

Teaching Requirement
Ph.D. students must fulfill a three quarter teaching requirement.

Normative Time to Ph.D.
17 quarters

Master's Degree

Students should refer to the Graduate Studies section of the catalog for the minimum master's degree requirements.

Each student, with the advice of their M.S. Guidance Committee, will select courses that complement their research program (units vary).

Students must take at least two Entomology 2-unit seminar courses for a letter grade from the following list: ENTM 249, ENTM 251, ENTM 252, ENTM 253, ENTM 254, ENTM 255, ENTM 256, ENTM 257, ENTM 258, ENTM 259, ENTM 260, ENTM 262, ENTM 289, ENTM 423 (4 Units Total).

Thesis and Final Oral Examination
Following completion of their research, students submit a written thesis and conclude their studies with an oral public defense of the thesis.

Normative Time to M.S.
6 quarters

Opportunities for Interdisciplinary Graduate Study

Faculty from the Department of Entomology also participate in the following additional graduate programs:

- Biochemistry and Molecular Biology
- Cell, Molecular, and Developmental Biology (CMDB)
- Neuroscience
- Chemistry
- Environmental Toxicology
- Evolution, Ecology, and Organismal Biology (EEOB)
- Genetics, Genomics and Bioinformatics

These interdepartmental programs draw on the strengths of distinguished scientists from several units. For further information concerning work in these areas, see the respective program descriptions in the Programs and Courses section of this catalog or contact the CNAS Graduate Student Affairs Center, at (800) 735-0717.

Lower-Division Courses

ENTM 010 Natural History of Insects 4 Lecture, 3 hours; discussion, 1 hour. A study of the world of insects and their impact on humankind. Designed for non-entomology majors. Utilizes living and preserved insects and other visual aids.

ENTM 020 Bees and Beekeeping 4 Lecture, 2 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): none. Covers the fundamentals of keeping honey bees, their fascinating social behavior, and their economic importance as pollinators of agricultural crops and as producers of honey and other products. Includes demonstrations of bee biology and behavior with colonies of bees, as well as beekeeping techniques, equipment, and extraction of honey.

ENTM 050 The Evidence For Evolution 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Introduces and explores the extensive evidence supporting evolution as the driver of biological diversity. Designed for non-science majors and/or those with limited prior knowledge about biology. Includes the scientific method, paleontology, natural selection, genetics, speciation, and the importance of sex. Addresses the broader need for scientific literacy in society. Cross-listed with BPSC 050.

ENTM 060W Scicomm: Exploring Effective Communication Methods in the Life Sciences 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): WRIT 040P, may be taken concurrently; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; BIOL 005A with a grade of C- or better. Teaches the process of analyzing and translating scientific research into popular science stories. Introduces the art of science communication through written narratives. Provides resources and guidance on interpretation of scientific literature; interviewing scientists; and pursuing careers in entomology, the broader life sciences, and science writing. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits as alternatives to WRIT 030. Cross-listed with BPSC 060W.

Upper-Division Courses

ENTM 100 General Entomology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C with a grade of C- or better; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introductory study of insects, Earth's most diverse group of animals (75 percent of animal species are insects). Covers the anatomy, physiology, ecology, behavior, and diversity of insects. Focuses on insect identification. Cross-listed with BIOL 100.

ENTM 101 Evolution of Insect Genomes 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): BIOL 005C with a grade of C- or better; restricted to class level standing of sophomore, junior, or senior. Introduces the field of insect genomics and bioinformatics. Provides hands-on bioinformatic instruction of structural and functional aspects of insect genomes within an evolutionary framework. Topics include the genomic basis of key insect innovations, insect phenotypes such as pesticide resistance, and host plant specialization. Prior knowledge of coding not required.

ENTM 106 Insect Evolution 3 Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): BIOL 100/ENTM 100 or consent of instructor. Introduces principles of insect morphology, with emphasis on characters of phylogenetic and adaptive significance and insect evolution. Topics include the comparative anatomy and phylogenic relationships of extinct and living insect groups. Laboratory emphasizes principles of comparative morphology and evolutionarily important character complexes.

ENTM 107 Insect Biodiversity 4 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): BIOL 100/ENTM 100 or consent of instructor. Introduces the science of insect systematics. Emphasizes the diagnostic characters of the major taxa and insect biodiversity. Laboratories focus on developing skills in insect identification to the family level.

ENTM 108 Biology of Social Insects 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C with a grade of C- or better. Introduces the diversity of social lifestyles found in insects and the

ecological and evolutionary mechanisms that generated this diversity. Emphasizes an integration between classic theoretical studies and modern molecular research on the social insects.

ENTM 109 Field Entomology 4 Laboratory, 4 hours; field, 8 hours. Prerequisite(s): BIOL 100/ENTM 100 or equivalents or consent of instructor. Study and field collection of insects in selected ecological communities from the diversity of life zones comprising Southern California. Students prepare specimens collected to professional standards, identify specimens, and submit their collections for grading and incorporation into the Department of Entomology's teaching and research collections.

ENTM 111 Molecular Biology and Genomics of Human Disease Vectors 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A with a grade of C or better, BIOL 05LA with a grade of C or better. Introduces human diseases transmitted by insects/arthropods (insect vectors) that claim about a million deaths annually and cause enormous suffering globally. Highlights adaptations that have contributed to the evolutionary success of disease vectors as well as biotechnological advances in vector control.

ENTM 112 Systematics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C or equivalent. Principles and philosophy of classification: phylogenetic and phenetic methods, species concepts, taxonomic characters, evolution, hierarchy of categories, and nomenclature. Cross-listed with BIOL 112, and BPSC 112.

ENTM 114 Aquatic Insects 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C; or consent of instructor. Investigates aquatic insects as nutrient cyclers, pollution indicators, disease vectors, and fish food. Involves identification of major orders and families, morphological and physiological adaptations, and life history strategies. Laboratory emphasizes identification (collection) and includes a group field ecology project and two weekend field trips.

ENTM 123 Outreach and Science Communication in Entomology 4 Lecture, 2 hours; laboratory, 3 hours; workshop, 1 hour. Prerequisite(s): ENTM 100 with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Covers theory, principles, and practice of science communication using insects as models. Addresses the history of outreach, planning and conducting outreach events, and science communication. Focuses on digital outreach content. Includes designing displays, classroom/public presentation training and practice, interpersonal communication skills, and participation in the Insect Fair. Credit is awarded for one of the following ENTM 123 or ENTM 423.

ENTM 124 Agricultural Entomology 4 Laboratory, 4 hours; field, 8 hours. Prerequisite(s): BIOL 100/ENTM 100 or equivalent or consent of instructor. Identification, life history, ecology, distribution, and management of key pest and beneficial species learned through field observation, discussions with industry representatives, and laboratory study. Detailed notes and collections from field trips to all major growing regions of Southern California form the basis for laboratory discussion.

ENTM 125 Pesticide Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 008B, BIOL 005C or CHEM 08HB; CHEM 08LB or CHEM 08HLB. An introduction to the chemistry, modes of action, and use of insecticides, rodenticides, herbicides, and biopesticides from discovery to environmental interactions. Includes genetics of pesticide resistance development, resistance management, government regulation, probit analysis, dilution and calculations of treatment rates, and sustainable pest management. Cross-listed with ENTX 125, and PLPA 125.

ENTM 126 Medical and Veterinary Entomology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B, BIOL 005C; or consent of instructor. Covers biology, ecology, and management of arthropods that affect human and animal health. Considers arthropods as direct pests and vectors of notorious diseases (e.g., malaria, plague). Also addresses disease epidemiology and prevention, as well as control of pests and associated diseases.

ENTM 127 Insect Ecology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002B or PHYS 02HB; PHYS 02LB or PHYS 02HLB; BCH 100 or BCH 110A or BCH 110HA; STAT 010, or equivalent; or consent of instructor. Introduces principles of insect ecology with examples emphasizing the Arthropoda. Topics include factors governing population growth; ecological and evolutionary interactions with hosts, competitors, and natural enemies; structure of ecological communities; and adaptations to different environments. Cross-listed with BIOL 127.

ENTM 128 Principles of Insect Pest Management 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENTM 100 with a grade of C- or better. Covers factors influencing insect pest populations and various control methods (biological, chemical, cultural, genetics, host-plant resistance, mechanical, physical, and quarantine). Discusses the principle of integrated pest management (IPM) and highlights examples in agricultural, public health, urban, and veterinary IPM.

ENTM 129 Introduction to Biological Control 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BIOL 100 or ENTM 100; or consent of instructor. Introduces the concept of biological control as ecosystem engineering to suppress pests and invasive species. Provides examples of biological control agents and their characteristics. Presents case studies on host range testing, non-target impacts, mass-rearing tactics, and biological control in habitat restorations. Teaches basic statistical analysis through exercises with real datasets.

ENTM 130 Invasion Ecology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C with a grade of C- or better, BIOL 102 with a grade of C- or better; or consent of instructor. Explores the introduction, establishment, and impact of non-native invasive species. Considers how invasions differ across taxonomic groups from pathogens to plants to insects. Provides experience in monitoring and assessment methods.

ENTM 131 Invertebrate Neuroethology 3 Lecture, 3 hours. Prerequisite(s): BIOL 005C, CHEM 001C, CHEM 01HC, CHEM 008B or CHEM 08HB, MATH 005B or MATH 007B or MATH 009B or MATH 09HB, PHYS 002B or PHYS 02HB, PHYS 02LB or PHYS 02HLB, BCH 100 or BCH 100H or BCH 110A or BCH 110HA; or consent of instructor. Introduces principles of neuroethology with emphasis on invertebrate examples. Topics include introduction to invertebrate nervous systems, sensory systems, motor control, circadian rhythms, navigation, learning and memory, and social behavior.

ENTM 133 Urban Entomology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 100/ENTM 100 or consent of instructor. Biology and management of arthropod pests of the urban- industrial community with an emphasis on structural, household, and stored product pests. Exercises on the recognition and identification of these pests, their life histories, and strategies for their control.

ENTM 139 The Evolution of Conflict and Cooperation: Cheaters and Altruists 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; or consent of instructor. Explores the evolution of selfish and selfless behavior. An analysis of the evolutionary forces that create either conflict or cooperation among genes, microorganisms and their hosts, and kin. Cross-listed with MCBL 139.

ENTM 149 Special Topics Undergraduate Entomology 1 to 4 Lecture, 1 to 4 hours; laboratory, 0 to 12 hours. Prerequisite(s): BIOL 005C with a grade of C- or better; or consent of instructor. Explores topics in entomology within the area of specialization of the instructor(s). Content emphasizes recent advances in the special topic area and varies accordingly. Course is repeatable as content or topic changes to a maximum of 12 units.

ENTM 154 Forensic Entomology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C with a grade of C- or better; restricted to class level standing of sophomore, or junior, or senior; or consent of instructor. Introduces the application of entomological principles and collection of entomological data to be used as evidence in courts of law. Explores the basis of using insects to determine time and place of death in criminal cases including the collection, handling, and identification of insects of forensic importance. Cross-listed with BIOL 154.

ENTM 162 Insect Behavior 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C with a grade of C- or better or BIOL 100 with a grade of C- or better or ENTM 100 with

a grade of C- or better; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An analysis of the mechanisms that cause and control behavioral reactions of insects. Emphasizes ethological and physiological knowledge concerning orientation mechanisms, communication systems, learning, and the role of the nervous system in integrating behavior in insects. Cross-listed with BIOL 162.

ENTM 173 Insect Physiology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B, BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introduction to principles of insect physiology. Covers growth, development and hormones, cuticle, nervous system, circulation, respiration, digestion, nutrition, excretion, reproduction, water balance, and temperature relations. Prior knowledge of insects not required. Cross-listed with BIOL 173.

ENTM 180 Capstone Research Seminar in Entomology 2 Seminar, 1 hour; discussion, 1 hour; Prerequisite(s): ENTM 100, ENTM 107, upper-division standing in Entomology; or consent of instructor; ENTM 173 is recommended. Capstone course that provides undergraduate students majoring in Entomology with the experience of synthesizing and integrating knowledge and skills gained throughout the Entomology program. Satisfactory (S) or No Credit (NC) grading is not available.

ENTM 184 Planning For A Postgraduate Career in Life Sciences 2 Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; restricted to major(s) Biochemistry, Biology, Cell, Molecular, and Developmental Biology, Entomology, Microbiology, Neuroscience, Plant Biology; or consent of instructor. Introduces life science majors to diverse career options in industry, government, and academia. Develops skills for finding and acquiring jobs. Emphasizes careers in the agricultural sciences, biotechnology, and related areas through presentations by professionals representing a variety of educational levels and careers. Cross-listed with BPSC 184.

ENTM 190 Special Studies 1 to 4 Individual Study, 3 to 12 hours. Prerequisite(s): upper-division standing and consent of instructor. Directed studies by a faculty member to address specific curricular needs. A written proposal signed by the supervising faculty member and the undergraduate advisor is required. Course is repeatable to a maximum of 4 units.

ENTM 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): upper-division standing and consent of instructor. Original research conducted under faculty supervision. A written proposal signed by the supervising faculty member and the undergraduate advisor is required. Requires a formal oral presentation, poster project, or a written report. Course is repeatable to a maximum of 6 units.

ENTM 198I Individual Internship in Entomology 1 to 12 Written work, 1 to 12 hours; internship, 2 to 24 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; and consent of instructor. Provides an off-campus internship related to entomology. Internship conducted in the public or private sector but is jointly supervised by an off-campus sponsor and a faculty member in Entomology. Requires an initial written proposal, journal or lab notebook and a final written report. Course is repeatable to a maximum of 16 units.

ENTM 199 Senior Research 1 to 4 Research, 3 to 12 hours. Prerequisite(s): senior standing and consent of instructor. Research in entomology performed under supervision of a faculty member. A written proposal signed by the supervising faculty member and the undergraduate advisor is required. Requires a formal written report in the format of a research publication. Course is repeatable to a maximum of 6 units. Credit is awarded for only one of ENTM 199 or ENTM 199H..

ENTM 199H Senior Honors Research 1 to 5 Laboratory, 3 to 15 hours. Prerequisite(s): senior status; consent of instructor; a GPA of 3.5 or better in Entomology courses and 3.2 in all University course work. Honors course corresponding to ENTM 199. Research in entomology under supervision of a faculty member in entomology. A written proposal signed by the supervising faculty member and the undergraduate advisor is required. The student will submit a written report. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 6 units. Credit is awarded for only one of ENTM 199 or ENTM 199H.

Graduate Courses

ENTM 201 Core Areas of Entomology 1: Subcellular-Cellular Disciplines 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; graduate standing; or consent of instructor. Introduces principles of molecular biology, insect physiology, and insect morphology. Topics include genetics, genomics, genetic manipulations, endocrine and hormonal signaling, ecdysis, reproduction, insect integumentary systems, flight mechanisms, and the muscle, nervous, and sensory systems.

ENTM 201L Core Laboratory Techniques in Molecular Biology & Insect Morphology 1 Laboratory, 3 hours. Prerequisite(s): BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; graduate standing; or consent of instructor. Introduces core techniques for studying insects at the molecular and organismal levels. Includes hands-on exercises to learn sample handling, nucleic acid extraction, PCR, sequencing, microscopy, dissection, and feature identification.

ENTM 202 Core Areas of Entomology 2: Suborganismal-Organismal Disciplines 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENTM 201; graduate standing; or consent of instructor. Introduces the principles of insect evolution and insect behavior. Topics include systematic theory, evolution, insect sampling, insect curation, insect identification, and insect behavior.

ENTM 202L Insect Biodiversity and Systematics Laboratory 1 Laboratory, 3 hours. Prerequisite(s): ENTM 201, ENTM 201L; graduate standing; or consent of instructor. Uses hands-on experiences to introduce students to insect biodiversity and molecular phylogenetic approaches. This course also includes professional development training in research ethics.

ENTM 203 Core Areas of Entomology 3: Supraorganismal Disciplines 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENTM 202; undergraduate course in ecology; graduate standing; or consent of instructor. Introduces principles of insect ecology, genetics, evolution, and pest management. Addresses insect population dynamics and community interactions, genetics of geographic variation, insect behavior, and the management and control of pestiferous species. Includes computer simulations and use of molecular tools applied to supraorganismal phenomena.

ENTM 203L Laboratory Exercises in Design and Analysis of Entomological Experiments 1 Laboratory, 3 hours. Prerequisite(s): ENTM 202, ENTM 202L; undergraduate course in statistics; graduate standing; or consent of instructor. Provides foundational knowledge in experimental design and statistical analysis to prepare for independent research. Addresses principles of experimental design, use of statistical software, common statistical approaches in entomological research, and data handling and curation.

ENTM 210 Molecular Biology of Human Disease Vectors 3 Lecture, 2 hours; seminar, 1 hour. Prerequisite(s): graduate standing; and consent of instructor. Covers the molecular aspects of vectors transmitting most dangerous human diseases. Involves lectures and student presentations about current issues in molecular biology and genomics of vector insects and pathogens they transmit. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CMDB 210, and MCBL 210.

ENTM 211 Genetic Technologies in Pest Insects 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces the concepts, history, theory, application, and regulatory and societal issues of insect genetic control. Includes laboratory instruction in contemporary insect genetic techniques of CRISPR-mediated gene editing, transposon-mediated insect transgenesis, and site-specific recombination as applied to insect control.

ENTM 212 Ecological Systems in Space and Time 4 Lecture, 3 hours; field, 30 hours per quarter. Prerequisite(s): one upper-division undergraduate course in population or community ecology or paleoecology; graduate standing; or consent of instructor. Focuses on how ecological systems are interpreted and reconciled at the community, landscape, and paleontological scales. Addresses the role of extrinsic factors operating at each of these scales. Also examines the historical development of our understanding of ecological systems at various scales. Cross-listed with EEOB 212, and GEO 212.

ENTM 219 Theory of Systematics 4 Lecture, 4 hours. Prerequisite(s): BIOL 112 or BPSC 112 or ENTM 112 or equivalent; graduate standing; or consent of instructor. Examines topics developed around a series of classical and recent papers on the principles, philosophy, and methodology of modern systematics and phylogenetic methods. Cross-listed with EEOB 219, and GEO 219.

ENTM 230 Entomophagous Insects 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BIOL 100/ENTM 100 or equivalent, graduate standing; or consent of instructor. Introduces the biology and identification of entomophagous insects. Students collect and rear parasites and prepare specimens according to professional standards. Laboratory identification focuses on the family level for parasitic insects. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ENTM 240 Research Methods in Insect Chemical Ecology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; and consent of instructor. Survey of the methods used in the isolation, identification, and bioassay of biologically active natural products. Topics include bioassay design and execution, and microscale chemical separation and identification techniques. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade.

ENTM 241 Insect-Plant Interactions 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 127 or ENTM 127; graduate standing; or consent of instructor. Concepts of the development and maintenance of ecological associations between plants and arthropod herbivores in ecological and evolutionary time; organization of arthropod communities on plants; phytochemical basis for the mediation of plant-arthropod associations; coevolution of plants and herbivorous insects; manipulation of plant-arthropod associations in arthropod pest management programs.

ENTM 242 Development of Hypotheses and Research Design 3 Lecture, 1 hour; discussion, 1 hour; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Teaches fundamentals of research topic selection, development of hypotheses, and selection of experimental designs. Students prepare full-length federal grant proposals, then review and rank them in grant panel review format.

ENTM 249 Special Topics in Entomology 1 to 6 Lecture, 1 to 6 hours; laboratory, 0 to 15 hours; Prerequisite(s): graduate standing or consent of instructor. Explores topics in entomology within the area of specialization of each faculty member. Content emphasizes recent advances in the special topic area and varies accordingly. Course is repeatable as content changes.

ENTM 250 Seminar in Entomology 1 Seminar, 1 hour. Prerequisite(s): graduating standing. A series of lectures by visiting scientists, staff and advanced graduate students on research topics in entomology and allied fields. Graded Satisfactory (S) or No Credit (NC).

ENTM 251 Seminar in Insect-Plant Interactions 2 Seminar, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Provides rigorous examinations and interpretation of recent publications in the area of insect-plant interactions. Subject matter varies from year to year. Course is repeatable.

ENTM 252 Seminar in Insect Behavior 2 Seminar, 2 hours. Prerequisite(s): BIOL 162 or ENTM 162; graduate standing; or consent of instructor. An analysis and interpretation of published experimental data dealing with insect behavior, and an attempt to derive general principles underlying behavior. Subject matter varies from year to year. Course is repeatable as content changes.

ENTM 253 Seminar in Urban and Industrial Entomology 2 Seminar, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Reviews and analyzes advanced and timely topics in urban and industrial entomology. Students who present a seminar receive a letter grade; other students receive a Satisfactory(S) No Credit grade. Course is repeatable.

ENTM 254 Seminar in Biological Control 2 Seminar, 2 hours. Prerequisite(s): BIOL 127 or ENTM 127, ENTM 129; graduate standing; or consent of instructor. Addresses concepts, questions, and hypotheses in biological control. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

ENTM 255 Seminar in Medical and Veterinary Entomology 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Rigorous review and analysis of advanced topics in medical and veterinary entomology and related disciplines. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes.

ENTM 256 Seminar in Systematic Entomology 2 Seminar, 2 hours. Prerequisite(s): BIOL 112 or BPSC 112 or ENTM 112; graduate standing; or consent of instructor. Selected topics in insect systematics. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes.

ENTM 257 Pollinators and Pollination Seminar 2 Seminar, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Selected topics in pollinator health and pollination. Students who present a seminar receive a letter grade; other students receive a Satisfactory(S) No Credit grade. Course is repeatable.

ENTM 258 Seminar in Insect Pest Management 2 Seminar, 2 hours. Prerequisite(s): graduate standing; and consent of instructor. Selected topics in insect pest management. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes.

ENTM 259 Seminar in Cooperation and Sociality 2 Seminar, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Focuses on understanding the evolution, ecology, and behaviors of social arthropods. Includes exploration, presentation, and discussion in selected topics in cooperation and sociality in insects and arachnids. Course is repeatable to a maximum of 4 units.

ENTM 260 Ciber Seminar: Recent Advances in Honey Bee Health Research 2 Seminar, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Reviews and discusses recent scientific advances and activities in pollinator health research. Seminar presentation required for letter grade; otherwise, taken for Satisfactory (S) or No Credit (NC). Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 4 units.

ENTM 261 Seminar in Genetics, Genomics, and Bioinformatics 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BIOL 261, BPSC 261, PLPA 261, and GEN 261.

ENTM 262 Molecular Biology of Arthropod Disease Vectors 2 Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Seminar series sponsored by the Center for Disease-Vector Research at the Institute for Integrative Genome Biology. Provides an opportunity for graduate students to discuss current issues of molecular biology and genomics of vector insects and pathogens they transmit with guest speakers. Course is repeatable to a maximum of 4 units. Cross-listed with MCBL 262.

ENTM 263 Seminar in Thesis and Dissertation Proposal Writing 2 Seminar, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. This course is designed to assist students in preparing a dissertation research proposal. Students will learn how to construct research questions, develop literature synthesis strategies and

methodological means of investigation around their research topic. Students will submit a draft of their thesis/dissertation proposal by the end of the course.

ENTM 271 Research Seminar in Management of Vegetable Crop Pests 1 Seminar, 1 hour. Prerequisite(s): graduate standing; and consent of instructor. Seminar and critical discussion emphasizing current research and advances in management of vegetable crop pests. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENTM 272 Research Seminar in Insect Communication and Behavior 1 Seminar, 1 hour. Prerequisite(s): graduate standing; and consent of instructor. Seminar and critical discussion emphasizing current research and advances in insect communication and behavior. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENTM 276 Research Seminar in Medical, Urban, and Veterinary Entomology 1 Seminar, 1 hour. Prerequisite(s): graduate standing; and consent of instructor. Seminar and critical discussion emphasizing current research and advances in medical, urban, and veterinary entomology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENTM 277 Research Seminar in Insect Biochemistry and Toxicology 1 Seminar, 1 hour. Prerequisite(s): graduate standing; and consent of instructor. Seminar and critical discussion emphasizing current research and advances in insect biochemistry and toxicology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENTM 289 Special Topics in Neuroscience 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussion of selected topics in neuroscience. Content and instructor(s) vary each time course is offered. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with BCH 289, BIOL 289, CHEM 289, NRSC 289, and PSYC 289.

ENTM 290 Directed Studies 1 to 6 Prerequisite(s): graduate standing. Literature studies on special topics under direction of a member of the staff. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENTM 291 Individual Study in Coordinated Areas 1 to 6 Prerequisite(s): graduate standing Faculty assisted programs of individual study for candidates who are preparing for examinations. The following rules apply: 1) Up to 6 units may be taken prior to award of the Master's degree, such units to be in addition to minimum unit requirements for the degree; 2) Up to 12 additional units may be taken prior to advancement to candidacy for the Ph.D.; 3) The course may be repeated within these limits. Graded Satisfactory (S) or No Credit (NC).

ENTM 297 Directed Research 1 to 6 Prerequisite(s): graduating standing. Exploratory research toward the development of the dissertation problem or other research not specifically for thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENTM 299 Research For Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing. Original research in an area selected for the advanced degree. Course is repeatable.

Professional Courses

ENTM 301 Teaching Entomology at the College Level 1 Seminar, 1 hours. Prerequisite(s): graduate standing in Entomology. A program of weekly meetings and individual formative evaluation required of new entomology Teaching Assistants. Covers instructional methods and classroom/section activities most suitable for teaching Entomology. Conducted by departmental faculty or the Teaching Assistant Development Program. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENTM 302 College Teaching Practicum 1 to 4 Practicum/consultation, 3 to12 hours. Prerequisite(s): graduate standing and consent of instructor. Supervised teaching in college level classes under supervision of the course instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENTM 303 Philosophy and Pedagogy of Teaching Undergraduate Life Sciences 3 Lecture, 1 hour; laboratory, 3 hours; workshop, 1 hours. Prerequisite(s): graduate standing in life sciences. Explores the opportunities and challenges associated with developing an undergraduate course in the life sciences. Emphasizes determining how students learn, as well as exploring contemporary instruction methods that foster student engagement in the classroom. Graded Satisfactory (S) or No Credit (NC). Cross-listed with BIOL 303.

ENTM 423 Outreach and Science Communication in Entomology 2 Laboratory, 3 hours; workshop, 1 hour. Prerequisite(s): ENTM 202 with a grade of C- or better; graduate standing; or consent of instructor. Covers science communication using insects as models. Addresses planning and conducting outreach events and science communication. Focuses on digital outreach content through different media. Includes display design, classroom/public presentation training and practice, communication skills, and participation in the Insect Fair. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following ENTM 423 or ENTM 123.

Environmental Engineering

See Chemical and Environmental Engineering

Environmental Sciences

Subject abbreviation: ENSC
College of Natural and Agricultural Sciences

Daniel Schlenk, Ph.D., Chair
Ying-Hsuan Lin, Ph.D., Vice Chair
CNAS Undergraduate Academic Advising Center, (951) 827-7294;
CNASstudent@ucr.edu,
envisci.ucr.edu

Professors

Hoori Ajami, Ph.D. *Groundwater Hydrology*
Roya Bahreini, Ph.D. *Atmospheric Science*
Daniel Schlenk, Ph.D. *Aquatic Ecotoxicology*
Jiri Simunek, Ph.D. *Hydrology*
David Volz, Ph.D. *Environmental Toxicology*

Professors Emeriti

Michael A. Anderson, Ph.D. *Environmental Chemistry*
Christopher Amrhein, Ph.D. *Soil Chemistry*
Janet T. Arey, Ph.D. *Atmospheric Chemistry*
Roger Atkinson, Ph.D. *Atmospheric Chemistry*
Andrew C. Chang, Ph.D. *Agricultural Engineering*
David M. Crohn, Ph.D. *Biosystems Engineering*
David E. Crowley, Ph.D. *Soil Microbiology*
Robert C. Graham, Ph.D. *Soil Mineralogy*
Jianying "Jay" Gan, Ph.D. *Environmental Chemistry*
William A. Jury, Ph.D. *Soil Physics*
Lanny J. Lund, Ph.D. *Soil Morphology, Genesis, and Classification*
David R. Parker, Ph.D. *Soil Biogeochemistry*
Roberto Sánchez-Rodriguez, Ph.D. *Environmental Policy*
James Sickman, Ph.D. *Watershed Hydrology and Biochemistry*
Henry J. Vaux, Jr., Ph.D. *Natural Resource Economics*
Laosheng Wu, Ph.D. *Soil Physics*
Marylynn V. Yates, Ph.D. *Environmental Microbiology*
Paul J. Ziemann, Ph.D. *Atmospheric Science*

Associate Professors

Andrew Gray, Ph.D. *Watershed Hydrology*
Tamara Harms, Ph.D. *Ecosystem Ecology and Biogeochemistry*
Pete Homyak, Ph.D. *Ecosystem and Soil Microbial Processes*
Francesca Hopkins, Ph.D. *Climate Change and Sustainability*
King-Fai Li, Ph.D. *Environmental Science/Statistics*
Ying-Hsuan Lin, Ph.D. *Environmental Toxicology*
William Porter, Ph.D. *Environmental Sciences*
Elia Scudiero, Ph.D. *Precision Agriculture*
Amir Verdi, Ph.D. *Agricultural and Urban Water Management*
Samantha C. Ying, Ph.D. *Soil Biogeochemistry*

Assistant Professors

Wei-Chun Chou, PhD. *Environmental Health*
Pedro Martinez, Ph.D. *Pedology*
Lindsay McCulloch, Ph.D. *Teaching*
Saverio Perri, Ph.D. *Soil Physics*

Cooperating Faculty

Emma Aronson, Ph.D. (Plant Pathology and Microbiology)
Ariel Dinar, Ph.D. (School of Public Policy)
Darrel Jenerette, Ph.D. (Botany and Plant Sciences)
Haizhou Liu, Ph.D. (Chemical and Environ mental Engineering)
Kurt A. Schwabe, Ph.D. (School of Public Policy)
Haofei Zhang, Ph.D. (Chemistry)

Major

The Department of Environmental Sciences offers B.A. and B.S. degrees in Environmental Sciences. Students are encouraged to concentrate their studies in one of five specialization areas: Soil Sciences, Hydrologic Sciences, Atmospheric Sciences, Environmental Toxicology, and Environmental Management.

Modern human activities related to natural resource development, agriculture, urbanization, industry, and transportation are placing unprecedented pressure on the earth's life support systems. Changes taking place in atmospheric physics and chemistry, land cover, freshwater and marine resources, and chemical cycling threaten the ability of human society to sustainably meet current and future needs. Science-based solutions are needed to sustainably manage our natural resources and improve public health. To help meet these challenges, our program emphasizes training for students in the biological, chemical, and physical aspects of environmental sciences and health, centered on the major environmental media of air, soil, water, and the biosphere.

The structure of the Environmental Sciences curriculum provides a broad scope of instruction that enables students to explore various disciplines and professions focused on solving environmental problems. All students majoring in Environmental Sciences must complete a set of "core requirements" consisting of courses that provide a basic understanding of the physical, biological, and social sciences and their application to the analysis of environmental processes and management issues. In addition to the core requirements, students must complete 8 units of lower-division and 20 units of upper-division elective courses.

Students have the option to select their electives from different specialization areas or to focus their training in one of the five specialization areas based on their own educational and career objectives. The specialization areas of Soil Sciences, Hydrologic Sciences, or Atmospheric Sciences are suitable for students wishing to maintain a broad range of choices in technically-oriented environmental professions such as pollution control, hazardous materials management, public health, natural resource management, environmental monitoring, and impact analysis. These options also provide the necessary background for graduate study in soil science, water resources, or atmospheric sciences as well as interdisciplinary areas such as ecosystem science and forestry. The Environmental Toxicology specialization area emphasizes the chemistry and biochemistry of toxic substances in the environment, preparing students for careers dealing with the control of contaminants in various environmental media as well as related fields such as public health and industrial hygiene. The Environmental Management specialization area is oriented for the social context of environmental sciences and prepares students for careers dealing with environmental regulation, land-use planning, environmental impact analysis, and administration of environmental protection programs.

Environmental Internship Program

The Environmental Internship Program offers students opportunities to work with government agencies, private firms, and nonprofit organizations involved in environmental affairs. As excursions into professional life, internships provide "hands-on" experience in applying the principles presented in courses. Beyond the highly specialized training associated with on-the-job activities, students can gain insights into their aptitudes, aspirations and work habits that enable them to clarify their academic and career objectives. Professional acquaintances established during internships can continue to serve as important contacts for students after the internship is completed.

Although most internships are part-time (12–15 hours per week) positions in the Riverside area, organizations that host student interns are located throughout the United States, including Washington, D.C. and Sacramento, CA. Students working as interns may receive stipends, hourly wages, or serve as volunteers, depending upon the specific appointment. Up to 16 units of credit toward the bachelor's degree may be earned by developing an academic component of the internship in consultation with a faculty supervisor and enrolling in ENSC 198-I.

Undergraduate Research

Students interested in enhancing the status of knowledge about environmental processes or seeking new solutions to environmental problems may gain training and experience as part-time employees in the department's research laboratories and other research facilities, such as the U.S. Salinity Laboratory, located on campus, and the USDA Pacific Southwest Research Station, located on Canyon Crest Drive. Those wishing to conduct their own research under faculty supervision may earn academic credit by enrolling in ENSC 197. Expenses for both laboratory and field experiments are eligible for funding by the campus mini-grant program which supports undergraduate research and creative activity.

California Teach-Science and Mathematics Initiative (CalTeach-SMI)

California Teach-Science and Mathematics Initiative (CalTeach-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CalTeach-SMI at UCR offers undergraduate students opportunities to explore STEM teaching as a career option. Through CalTeach-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements. The CalTeach-SMI Resource Center provides future STEM teachers opportunities to promote planning and professional development towards a science/mathematics education career.

For more information about the CalTeach-SMI program, please visit **smi.ucr.edu**, the Resource Center at 1114 Pierce Hall, or on Facebook at **facebook.com/ScienceMathInitiativeAtUcr** and on Instagram at **instagram.com/smiatucr/**.

Transfer Selection Criteria

Applicants to majors in the College of Natural and Agricultural Sciences are selected on the basis of academic preparation, as assessed by their GPA and the strength of preparation for the intended major. A GPA of at least 2.70 is required. (This is a baseline GPA for consideration and not a guarantee of admission.)

In addition, applicants will need to complete college courses comparable to at least two of the following UCR year-long sequences in order to meet selection criteria for this major. Courses must be completed with "C-" grades or better:

MATH 007A or MATH 009A; MATH 007B or MATH 009B (mandatory)

And at least one sequence from:

1. BIOL 005A/BIOL 05LA or BIOL 020 and BIOL 005B (and BIOL 005C, if articulated)
2. CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, and CHEM 01LC
3. Organic chemistry (one-year lower-division), each course completed with a grade of "B" or better
4. PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB, PHYS 002C, and PHYS 02LC
5. PHYS 040A, PHYS 040B, and PHYS 040C
6. MATH 009C, MATH 010A, MATH 010B, and MATH 046

Courses must be completed with a letter grade, with no grade lower than a "C-." Students should visit **assist.org** for updated and comprehensive major preparation requirements.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the College's breadth requirements. Consult with a department advisor for course planning.

Major Requirements

The major requirements for both the B.A. and the B.S. degrees in Environmental Sciences are

as follows: Students must fulfill all required core courses in environmental science, biology, chemistry, math, physics, and statistics with a grade point average of 2.0 or better and no grade lower than a C-. If a grade lower than a C- is received in 2 or more core courses required for the major, either in separate courses or repetitions of the same course, the student may be discontinued from the major. Students must, under such circumstances, petition the department to remain in the major. Students in Environmental Sciences are required to demonstrate adequate progress towards earning the degree. Adequate progress is defined as completion of MATH 009B or MATH 09HB or MATH 007B prior to the beginning of the Winter Quarter of the second year of residence or Junior standing (>90 units) and at least one course from ENSC 100, ENSC 101, or ENSC 102 must be completed prior to the end of the third year of residence or senior standing (>135 units).

Note

To gain maximum benefit from participating in the Undergraduate Research and Environmental Internship Programs, students intending to enroll in ENSC 197 and ENSC 198-I should contact their advisor during the quarter prior to enrollment in these courses.

Core Requirements

1. Lower-division requirements (77–79 units)
   a) ENSC 001 and ENSC 002
   b) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B
   c) CHEM 001A or CHEM 01HA, CHEM 001B or CHEM 01HB, CHEM 001C or CHEM 01HC, CHEM 01LA or CHEM 1HLA, CHEM 01LB or CHEM 1HLB, CHEM 01LC or CHEM 1HLC
   d) CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA; CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB
   e) MATH 007A or MATH 009A or MATH 09HA; MATH 007B or MATH 009B or MATH 09HB
   f) PHYS 002A or PHYS 02HA, PHYS 02LA or PHYS 02HLA, PHYS 002B or PHYS 02HB, PHYS 02LB or PHYS 02HLB, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC
   g) POSC 010
   h) STAT 010
   i) One course from ENSC 006, ECON 006, PBPL 001, ECON 003, or POSC 020
2. Upper-division requirements (18 units): ENSC 100, ENSC 101, ENSC 102, ENSC 110, ENSC 191

Electives

Students are free to choose from the lists below to fulfill their lower-division and upper-division elective requirements:

1.Lower-division electives (8 units):

At least two electives from BIOL 005C, CHEM 005, CHEM 008C and CHEM 08LC, CHEM 08HC and CHEM 08HLC, MATH 009C or MATH 09HC or MATH 010A, GEO 001 or GEO 002

2. Upper-division electives (20 units):

At least 20 units of electives from the following list, with a minimum of 16 units from Environmental Sciences or Environmental Toxicology:

ENTX 101, ENTX 154, ENSC 103/ENTX 103, ENSC 104, ENSC 105, ENSC 107, ENSC 120/NEM 120, ENSC 127, ENSC 130, ENSC 133/MCBL 133, ENSC 134/BPSC 134, ENSC135/CHEM 135/ENTX 135, ENSC 136/CHEM136, ENSC 138/GEO 138, ENSC 139/GEO 139, ENSC 140, ENSC 144/ENVE 144, ENSC 163, ENSC 165, ENSC 172, ENSC 174, ENSC 175, ENSC 177, ENSC 197, ENSC 198-I, BCH 100 or both BCH 110A or BCH 110HA and BCH 110B or BCH 110HB; BCH 110C or BCH 110HC or BIOL 107A; BIOL 102 or BIOL 121/MCBL 121; BIOL 116, BIOL 121L/MCBL 121L, BPSC 104/BIOL 104, BPSC 146, BPSC 165, BPSC 166, CBNS 150/ENTX 150, CHEM 109, GEO 157, GEO 160

Suggested courses of study are also provided below for specialized areas in environmental sciences to assist students to meet minimum employment requirements for entry-level positions in government agencies, nongovernment organizations (NGO), and environmental consulting firms. Students are strongly encouraged to schedule a meeting with a Faculty in their specialization area of interest for curriculum and career advice. A list of core Faculty in each specialization area is available at **envisci.ucr.edu/undergrad**.

Soil Sciences:
Recommended to meet lower-division electives: BIOL 005C, GEO 001 or GEO 002, MATH 009C or MATH 09HC or MATH 010A; Recommended to meet upper-division electives: ENSC 104, ENSC 107, ENSC 120/NEM 120, ENSC 127, ENSC 133/MCBL 133, ENSC 134/BPSC 134, ENSC 138/GEO 138, ENSC 139/GEO 139, ENSC 144, ENSC 175, ENSC 177, BPSC 146

Hydrologic Sciences:
Recommended to meet lower-division electives: MATH 009C or MATH 09HC or MATH 010A, GEO 001 or GEO 002; Recommended to meet upper- division electives: ENSC 105, ENSC 107, ENSC 127, ENSC 136/CHEM136, ENSC 140, ENSC 163, ENSC 165, ENSC 175, ENSC 177

Atmospheric Sciences:
Recommended to meet lower-division electives: CHEM 005, CHEM 08C and CHEM 08LC, CHEM 08HC and CHEM 08HLC, MATH 009C or MATH 09HC or MATH 010A; Recommended to meet upper-division electives: ENSC 103/ENTX 103, ENSC 130, ENSC135/CHEM 135/ENTX 135, ENSC 136/CHEM 136, ENSC 175, ENSC 177, GEO 160

Environmental Toxicology:
Recommended to meet lower-division electives: BIOL 005C, CHEM 005, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 8HLC; Recommended to meet upper- division electives: ENTX 101 required + at least 3 electives from ENSC or ENTX: ENSC 103/ENTX 103, ENSC 135/CHEM 135/ENTX 135, ENSC 136/CHEM 136, ENSC 177, CBNS 150/ENTX 150, ENTX 154, BCH 100 or both BCH 110A or BCH 110HA and BCH 110B or BCH 110HB, BIOL 102 or BIOL 121, BCH 110C or BCH 110HC or BIOL 107A

Environmental Management:
Recommended to meet lower-division electives: BIOL 005C, GEO 001 or GEO 002, MATH 009C or MATH 09HC or MATH 010A; Recommended to meet upper-division electives: ENSC 103/ENTX 103, ENSC 144, ENSC 153, ENSC 172, ENSC 174, ENSC 175, ENSC 177

Minor

The minor in Environmental Sciences consists of the following.

1. Lower-division requirements (23 or 24 units)
   a) ENSC 002
   b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
   c) One course from ENSC 006, ECON 006, PBPL 001, ECON 003, or POSC 020
2. Upper-division requirements (20 units)
   a) ENSC 100, ENSC 101, ENSC 102
   b) Eight (8) units of additional upper-division courses in Environmental Sciences, no more than 4 units of which are in courses numbered 190-198

Of the specified upper-division units, a minimum of 16 units must be unique to the minor and may not be used to satisfy major requirements.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Environmental Sciences Graduate Program

Subject abbreviation: ENSC
College of Natural and Agricultural Sciences

Daniel Schlenk, Ph.D., Director
Francesca Hopkins, Ph.D., Graduate Advisor for Continuing Students
Amir Verdi, Ph.D., Graduate Advisor for Admission
Anthony Dominguez, Student Services Advisor
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The Environmental Sciences Graduate Program offers the M.S. and Ph.D. degrees in Environmental Sciences.

Advanced training in Environmental Sciences is becoming increasingly necessary to address complex problems involving natural resources and environmental quality. Although this task frequently requires specialized knowledge in various fields of science, it also requires understanding and integration of a wide variety of interacting physical, chemical, biological, and societal influences. This interaction makes graduate study in environmental sciences distinct from many other scientific fields.

We have designed our program to offer advanced training in a number of specialized field areas within environmental sciences, operating within a single graduate degree program administered by the Department of Environmental Sciences. Students trained in the Environmental Sciences Graduate Program can fill many areas of expertise needed in the state and nation. Potential career opportuni-

ties exist at regulatory agencies, consulting firms, government and academic research institutions, and industrial research facilities.

Admission

Entry to the program requires completion of a baccalaureate degree in a field appropriate as preparation for graduate study in environmental sciences. Students normally will come to the program from an environmental sciences related discipline such as atmospheric science, aquatic science, earth science, environmental chemistry, hydrology, or soil science; or a basic science such as biology, chemistry, or physics.

Students may conduct research under the supervision of a sponsoring faculty member in any of the following field areas.

In addition to the following requirements, all applicants must meet the general requirements as set forth in this catalog under the Graduate Studies section.

Atmospheric Sciences

The Atmospheric Sciences field area encompasses diverse topics such as atmospheric chemistry and air quality, health effects of air pollution, drivers of radiative forcing and global warming, remote sensing of the atmosphere, and atmosphere-ocean interactions. Students will receive training in observing, modeling, and understanding atmospheric circulation and the fate of atmospheric chemical species. Much of the research being conducted addresses the societal impacts of air pollution and climate change.

Entrance requirements

There are no entrance requirements for the Atmospheric Sciences area beyond the general requirements for admission to the ESGP. It is recommended that students have completed one year of chemistry, as well as courses in general physics, organic chemistry, calculus through integrals, and statistics. Students who have not completed courses required for their research may need to complete additional courses to remedy deficiencies.

Environmental Chemistry and Ecotoxicology

The Environmental Chemistry and Ecotoxicology field area focuses on the sources, physical and chemical transformations, and removal processes of chemicals in soil, water, and air, and their impacts on ecological systems.

Entrance Requirements

There are no entrance requirements for the Environmental Chemistry area beyond the general requirements for admission to the ESGP. For Ecotoxicology, prospective students would be expected to have had courses in General Biology/Zoology and Organic Chemistry. Students who do not have sufficient background to take the core course or specific elective courses may, however, need to first take prerequisite courses.

Environmental Microbiology

The Environmental Microbiology field area encompasses the study of microbial processes in natural and agricultural ecosystems and the effects of microorganisms on environmental processes and environmental quality. Research topics include fundamental research on microbial physiology, genetics, and ecology as related to the environment, applied research on microbial effects on the fate and transport of pollutants, anthropogenic effects on microbial communities, fate and transport of human pathogenic microorganisms in the environment, and the application of microorganisms and microbial assays as indicators of soil and water quality.

Entrance Requirements

Students admitted to the Environmental Microbiology field area are expected to have a baccalaureate degree in biology, microbiology, or closely related field or demonstration of extensive background in biology and microbiology. Recommended prior course work includes chemistry (general, organic, and biochemistry), biology (general and advanced course work), microbiology (general), and statistics (general). Deficiencies in these areas must be remedied during the first year of graduate school.

Environmental and Natural Resource Economics and Policy

The economics and policy field area is not currently accepting new students. Students seeking advanced training in environmental and natural resource economics and policy should contact the Graduate Advisors in the Department of Economics and the School of Public Policy at UC Riverside for alternative programs of study.

Hydrologic Sciences

The Hydrologic Sciences field area offers comprehensive training in the understanding and quantification of physical and biogeochemical processes that govern movement, storage, and quality of water in the environment. Students can specialize in a variety of areas including catchment hydrology, ecohydrology, vadose zone and groundwater hydrology, hydrologic modeling, irrigation and water management in agricultural fields and urban landscapes, catchment biogeochemistry, contaminant fate and transport, earth surface processes, and related areas.

Entrance requirements

There are no entrance requirements for the Hydrologic Sciences area beyond the general requirements for admission to the ESGP. It is recommended that students have completed one year of general chemistry, general physics, organic chemistry, calculus through differential equations, statistics, and physical geology or physical geography.

Soil and Water Sciences

The Soil and Water Science field area offers comprehensive training in the chemistry, physics, biology, and ecology of soils, surface waters and wetlands. Students can specialize in a variety of areas, including soil and aquatic chemistry, limnology, soil-plant relations, biogeochemistry, bioremediation, geomicrobiology, contaminant fate and transport, water resources management, hillslope processes, soil genesis, soil mineralogy and geomorphology, and related areas.

Entrance Requirements

Admission to the Soil and Water Sciences field area requires a baccalaureate degree with preparation in both physical and life sciences. It is recommended that students have completed one year of general chemistry, as well as courses in general physics, organic chemistry, calculus through integrals, general biology, statistics, and physical geology or physical geography.

Environmental Sciences and Management

The Environmental Sciences and Management field area is not currently accepting new students. Students seeking advanced training in environmental management and policy should contact the Graduate Advisors in the Department of Economics and the School of Public Policy at UC Riverside for alternative programs of study.

Course Work

The Ph.D. and M.S. degree programs both require completion of the following courses.

- Each student must complete ENSC 227.
- Each student must complete either ENSC 200 or ENSC 232.
- Each student must complete at least one additional graduate-level, four-unit elective within or outside of the Department of Environmental Sciences. This requirement can also be met by taking an upper division ENSC course concurrently with ENSC 292.

Each student may complete additional upper-division undergraduate courses and/or graduate-level courses depending on the student's field area and research focus.

Students with a M.S. objective may need to take additional courses to fulfill the requirements of the **Plan I (Thesis)** or **Plan II (Comprehensive Examination)** options. Upon acceptance to the program, the student will select an Advisory Committee made up of three members of the participating faculty in the ESGP to assist in the planning of the individualized curriculum. Electives are chosen in consultation with the Advisory Committee. Students are encouraged to attend a seminar each quarter (to be chosen in consultation with the major advisor). Students must complete 2 units of ENSC 401 (Professional Development in Environmental Sciences) within their first year of entering the ESGP. There is no foreign language requirement for the program.

Master's Degree

The Department of Environmental Sciences offers the M.S. degree in Environmental Sciences under the Plan I (Thesis) and Plan II (Comprehensive Examination) options. The general requirements for the M.S. degree are found in the Graduate Studies section of the General Catalog. All students are required to give a presentation annually at the Environmental Sciences Graduate Program Student Symposium.

Plan I (Thesis)

Plan I (Thesis) Students must complete a minimum of 36 quarter units of graduate and upper-division undergraduate courses in, or significantly related to, Environmental Sciences. These must include the course requirements given above. At least 24 of the 36 units must be in graduate courses. A maximum of 12 of these units may be in graduate research for the thesis. No more than 4 units of ENSC 290 and 2 units of graduate seminar courses may be applied toward the degree. A thesis must be written and accepted by the M.S. thesis committee members, and a final oral defense

of the thesis must be passed.

Plan II (Comprehensive Examination)
Students must complete a minimum of 36 quarter units of graduate and upper-division undergraduate courses in, or significantly related to, Environmental Sciences. These must include the course requirements given above. At least 18 units must be in graduate courses. Students may count no more than 2 units of graduate seminar courses and 6 units of graduate internship courses toward the required 18 units and no units from graduate research for thesis or dissertation.

Students must take a comprehensive written examination that covers fundamental topics in environmental sciences. The written examination, which is three to four hours long, is prepared and evaluated by a committee appointed by the field director. The examination is taken during the latter part of the final quarter in the M.S. program. Students must wait at least eight weeks before retaking a failed examination. Students failing the examination twice are dismissed from the program.

Normative Time to Degree 2 years

Doctoral Degree

The Department of Environmental Sciences offers the Ph.D. degree in Environmental Sciences. The general requirements for the Ph.D. degree are found in the Graduate Studies section of the General Catalog.

Course Work
Students must complete the course requirements given above. All students are required to give a presentation annually at the Environmental Sciences Graduate Program Student Symposium.

Ph.D. Written Qualifying Examination
Following completion of all course work prescribed by the student's Advisory Committee, a Ph.D. Written Qualifying Examination will be prepared and administered to the student by a Ph.D. Written Qualifying Examination Committee. The Ph.D. Written Qualifying Examination Committee will consist of at least three faculty members with interests in the student's line of research. The purpose of this examination is to determine that the student has gained sufficient knowledge in the chosen field to perform professionally and competently. This exam may be attempted only twice. If this exam is failed twice, the student may be redirected to the M.S. degree if the student does not already hold an M.S. in Environmental Sciences or terminated from the program.

Ph.D. Oral Qualifying Examination
A student who satisfactorily passes the Ph.D. Written Qualifying Examination may proceed with the Ph.D. Oral Qualifying Examination, which will focus on the dissertation proposal. This examination is conducted before the Oral Qualifying Examination Committee, consisting of five faculty members, one of whom must be from outside the ESGP. This examination may be attempted only twice. If this exam is failed twice, the student will be redirected to the M.S. degree if the student does not already hold an M.S. in Environmental Sciences or terminated from the program. The Ph.D. Written and Oral Qualifying Examinations will normally be taken at the end of the second year of graduate study and before the start of the third year.

Oral Qualifying Exam and Final Defense Modality
The student and committee members should be present on campus. Students are encouraged to find committee members who are available to attend in person, with the exception of a non-UCR committee member, who may participate remotely though audio/video conferencing. Remote participation of UCR committee members must be approved by the committee chairperson. The student and committee chair must be physically present in the meeting room on campus except with permission for remote participation approved by the graduate program advisor.

Committee members nominated from outside the UC Academic Senate who participate remotely must have qualifications comparable to a UC Academic Senate member and submit a letter of intention and CV. In addition, strong academic justification for inclusion on the committee must be provided by the Graduate Advisor.

Dissertation
All Ph.D. students must write a doctoral dissertation, which must be read and accepted by all members of the Doctoral Dissertation Committee, comprised of at least three faculty members from the ESGP. A final oral dissertation defense in front of at least three Doctoral Dissertation Committee members is required.

Relationship between Master's and Doctoral Programs
The M.S. and Ph.D. programs are separate. Students who enter the Ph.D. program do not need to acquire a M.S. degree first, although students may elect to take both.

Normative Time to Degree 5 years

Lower-Division Courses

ENSC 001 Introduction to Environmental Science: Natural Resources 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to environmental science focusing on natural resource description, management, and conservation. Covers ecosystem characteristics and function; material and energy flows; population dynamics and influence of population on the environment; energy resources and conservation; and mineral and soil resources and their management.

ENSC 002 Introduction to Environmental Science: Environmental Quality 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to environmental science, focusing on the impact of human development and technology on the quality of natural resources and living organisms. Topics include soil, water, and air pollution; water, land, and food resources; wildlife management and species endangerment; toxicology and risk management; and solid and hazardous waste management.

ENSC 003 Contemporary Issues in the Environmental Sciences 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An issue-oriented approach to understanding the scientific principles behind environmental issues. Includes case studies of environmental issues appearing in the mass media that provide the context for assessing the status of scientific knowledge and its role in human decision making.

ENSC 004 Climate Change in California 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to the science of contemporary climate change including the drivers and impacts of change to date and into the future focusing on inland Southern California. Addresses individuals facing the climate crisis as well as explores possible solutions to the causes and consequences of climate change.

ENSC 092 Freshman Seminar in the Environmental Sciences 1 Seminar, 1 hour. Prerequisite(s): restricted to class level standing of freshman; restricted to major(s) Environmental Sciences; or consent of instructor. Introduction to the program of environmental sciences. Includes peer network development, career options and goals in the environmental sciences, opportunities for undergraduate research, development of learning and study skills, ethics in research and education, and an introduction to the faculty in ENSC. Graded Satisfactory (S) or No Credit (NC).

Upper-Division Courses

ENSC 100 Introduction to Soil Science 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CHEM 001C, CHEM 01LC or CHEM 01HC, CHEM 01HLC; ENSC 001, may be taken concurrently or ENSC 002, may be taken concurrently or CEE 010; or consent of instructor. Explores the fundamental principles of soil science and soils as a natural resource. Introduces the morphology, physics, chemistry, microbiology, fertility, classification, development, and management of soils in relation to the environment.

ENSC 101 Water Resources 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CHEM 001C, CHEM 01LC or CHEM 01HC, CHEM 01HLC; ENSC 001, may be taken concurrently or ENSC 002, may be taken concurrently; or consent of instructor. An introduction to the hydrologic cycle. Covers water sources, distribution, and conveyance; physical, chemical, and biological properties of water; water treatment and reuse; and regulatory framework.

ENSC 102 Introductory Atmospheric Science 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CHEM 001C, CHEM 01LC or CHEM 01HC, CHEM 01HLC; ENSC 001, may be taken concurrently or ENSC 002, may be taken concurrently; or consent of instructor. Covers the physical structure and chemical composition of the Earth's atmosphere including interactions with terrestrial, biological, and oceanic systems. Also emphasizes human impacts including an introduction of air quality and climate change concepts as well as an overview of air pollution control strategies.

ENSC 103 Environmental Pollution and Health 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENSC 001, ENSC 002. Focuses on the history, theory, and practice of assessing,

understanding, and mitigating impacts of the natural and built environment on human health. Reviews core disciplines that underpin the field of environmental health as well as case studies from industrialized, emerging, and developing countries around the world. Cross-listed with ENTX 103.

ENSC 104 Environmental Soil Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 005 or ENSC 100 or consent of instructor. Quantitative study of the chemistry of the solid, liquid, and gas phases in soils and sediments. Topics include solid and solution speciation, mineral solubility, ion exchange and adsorption reactions, oxidation-reduction, and the chemistry of organic contaminants and toxic trace elements in soils.

ENSC 105 Ecohydrology 4 Lecture, 3 hours; discussion, 1 hour; field trip, 4 hours per quarter. Prerequisite(s): ENSC 002. Introduction to the role of water in ecosystems. Explores the movement of water through ecosystems and interactions with biota across a range of climatic and ecological zones. Examines the major human impacts on hydrology and their ecological and environmental implications. Field trips to representative hydrological systems.

ENSC 107 Soil Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 007B or MATH 009B or MATH 09HB; PHYS 002A or PHYS 02HA; ENSC 100; or consent of instructor. Topics include physical properties of soils and methods of evaluation. Emphasizes movement of water, heat, gases, and chemicals through soil.

ENSC 110 Environmental Statistics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MATH 007B or MATH 009B or MATH 009HB; STAT 008 or STAT 010; or consent of instructor. Introduces the use of computers to solve mathematical problems arising in environmental sciences. Applies various computational methods (such as linear regression, optimization, Monte Carlo simulation, and data assimilation) to environmental problems using R.

ENSC 120 Soil Ecology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 002 or BIOL 005A, BIOL 05LA; CHEM 001C, CHEM 01LC or CHEM 01HC, CHEM 1HLC; ENSC 100; or consent of instructor. A study of soil biota and their relationships with plants and the soil environment. Emphasizes life strategies of soil organisms and methods to study them. Examines importance of microbial and faunal groups from the rhizosphere to the ecosystem. Explores impact on soil fertility, carbon and nitrogen cycles, and Earth's climate. Cross-listed with NEM 120.

ENSC 127 Fate and Transport of Contaminants in the Environment 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENSC 100; MATH 007B or MATH 009B or MATH 09HB; or consent of instructor. Topics include interactions of environmental conditions with abiotic and biotic transformation and transport of major organic and inorganic contaminants in the environment.

ENSC 130 Weather and Climate 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENSC 001; or consent of instructor. Introduces basic principles of atmospheric dynamics on both short- and long-term time scales focusing on current examples and in-class demonstrations. Covers basic concepts related to atmospheric dynamics such as wind, the radiation budget, precipitation, and natural disasters. Includes core principles of long-term changes.

ENSC 133 Environmental Microbiology 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s):BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C; or consent of instructor. Introduction to nonpathogenic microorganisms in the environment. Topics include an introduction to microbial biology and microbial and metabolic genetic diversity; methods; symbiotic interactions; biofilms; and geomicrobiology and biogeochemistry. Explores life in extreme environments and the effects of the physical and chemical environment on microbes. Cross-listed with MCBL 133.

ENSC 134 Soil Conditions and Plant Growth 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 104/BPSC 104 or ENSC 100; or consent of instructor. A study of the chemical, physical, and biological properties of soils and their influence on plant growth and development. Topics include soil-plant water relations; fundamentals of plant mineral nutrition; soil nutrient pools and cycles; soil acidity, alkalinity, salinity, and sodicity; root symbioses; and rhizosphere processes. Cross-listed with BPSC 134.

ENSC 135 Atmospheric Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB, or consent of instructor; ENSC 102 recommended. Structure of the troposphere and stratosphere; formation of atmospheric ozone; tropospheric NOx chemistry; methane oxidation cycle; phase distributions of chemicals; wet and dry deposition; chemistry of volatile organic compounds; formation of photochemical air pollution; modeling of air pollution and control strategies; stratospheric ozone depletion and global warming. Cross-listed with CHEM 135, and ENTX 135.

ENSC 136 Chemistry of Natural Waters 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 005 with a grade of "C-" or better or ENSC 101 with a grade of "C-" or better or consent of instructor. Introduction to processes controlling the chemical composition of natural waters. Topics include chemical equilibria, acid-base and coordination chemistry, oxidation-reduction reactions, precipitation-dissolution, air-water exchange, and use of equilibrium and kinetic models for describing marine nutrient, trace metal, and sediment chemistry. Cross-listed with CHEM 136.

ENSC 138 Pedology 4 Lecture, 3 hours; laboratory, 6 hours per quarter; field, 24 hours per quarter. Prerequisite(s): ENSC 100; GEO 001; or consent of instructor. Covers the study of soils in natural environments. Examines how soils form and their roles within ecosystems and landscapes. Topics include soil variability, soil classification, and soils as indicators of environmental conditions. Field trips emphasize description and interpretation of soils. Requires two 3-hour Laboratory activities and four 6-hour Field Trips. Cross-listed with GEO 138.

ENSC 139 Soils and Landforms of California 1 Term paper, 6 hours; field, 24 hours. Prerequisite(s): ENSC 138, may be taken concurrently or GEO 138, may be taken concurrently; or consent of instructor. Explores the genesis, morphology, and classification of California soils with an emphasis on soil-landform relationships. One three-day field trip focuses on soils and landforms within selected regions of California. Cross-listed with GEO 139.

ENSC 140 Limnology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENSC 101; or consent of instructor. A study of surface waters. Considers in detail the physical and chemical processes in surface waters, aquatic biology, ecosystem dynamics, and aspects of surface water quality and modeling.

ENSC 144 Solid Waste Management 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 002 or BIOL 005A, BIOL 05LA; CHEM 001C, CHEM 01LC or CHEM 01HC, CHEM 01HLC; ENSC 001, ENSC 002 or ENVE 171; MATH 007B or MATH 009B or MATH 09HB; or consent of instructor. A study of the characterization, collection, transportation, processing, disposal, recycling, and composting of municipal solid waste. Emphasizes accepted management strategies and design procedures for recovering or disposing solid wastes while protecting public and environmental well-being. Cross-listed with ENVE 144.

ENSC 154 Risk Assessment 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENTX 101; STAT 010; or equivalent; or consent of instructor. An introduction to the basic principles and methods by which health risks associated with exposure to chemical and physical agents are determined. Topics include hazard identification, dose response and exposure assessments, and risk characterization and management. Cross-listed with ENTX 154.

ENSC 163 Hydrology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENSC 100; ENSC 101; ENSC 110; MATH 007B or MATH 009B or MATH 09HB; or consent of instructor. Introduction to the scientific study of the hydrologic cycle. Covers the measurement and evaluation of hydrologic phenomena including the use of statistical methods. Explores computer techniques in hydrology with applications to water resource development and water quality problems, particularly those in California.

ENSC 165 Principles of Groundwater Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001B; ENSC 101; MATH 007B or MATH 009B or MATH 09HB. Covers the fundamental understanding of groundwater resources and aquifer properties. Explores physical principles of fluid flow in sediments and rocks, surface water-

groundwater interactions, and contaminant transport. Discusses current issues in groundwater management and sustainability with an emphasis on California water resources. Students present topics related to groundwater science and management.

ENSC 175 Spatial Analysis and Remote Sensing For Environmental Sciences 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ENSC 110; or consent of instructor. Explores the principles of spatial data analysis in environmental sciences. Provides comprehensive and systematic understanding of spatial analysis methods. Covers theory of remotely sensed data acquisition from satellites and UAVs and discusses image analysis techniques. Utilizes Geographic Information Systems (GIS) and statistical and image classification software.

ENSC 177 Environmental Sampling and Analysis 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): two of the following courses ENSC 100, ENSC 101, ENSC 102; or consent of instructor. Introduces sampling, preparation and quantitative analysis of environmental samples. Topics include environmental sampling design; sampling techniques; quality assurance/quality control (QA/QC); data collection and reporting; sample preparations; extraction and cleanup; chemical separations (chromatography); and instrumental detection methods relevant to quantitative environmental analysis.

ENSC 190 Special Studies 1 to 5 variable hours. Prerequisite(s): upper-division standing and consent of instructor. Special studies as a means of meeting special curricular problems. Graded Satisfactory (S) or No Credit (NC); however, students may petition the instructor for a letter grade. Course is repeatable.

ENSC 191 Seminar in Professional Development in Environmental Sciences 2 Seminar, 2 hours. Prerequisite(s): upper-division standing in Environmental Sciences or consent of instructor. Lectures and discussions on scientific writing, critical analysis in reading, public speaking, job interview and resume preparation, and professional conduct. Students make both written and oral presentations on topics in Environmental Sciences.

ENSC 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): Restricted to class level standing of junior, or senior; and consent of instructor. Individual research on a problem relating to environmental science to be conducted under the guidance of an instructor. Maximum of 4 units (with a letter grade) may count toward the upper-division elective requirement. Course is repeatable to a maximum of 8 units.

ENSC 198I Internship in Environmental Sciences 1 to 12 Field, 3 to 36 hours. Prerequisite(s): upper-division standing and consent of instructor. An academic internship involving participation in a functional capacity in the enhancement or maintenance of environmental quality. Conducted under the joint supervision of an off-campus sponsor and a faculty member in Environmental Sciences. One unit of credit for every three hours per week spent in internship. Graded Satisfactory (S) or No Credit (NC), but in exceptional cases student may petition for a letter grade. Course is repeatable to a maximum of 16 units.

Graduate Courses

ENSC 200 Fate and Transport of Chemicals in the Environment 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): one year of organic chemistry; graduate standing; or consent of instructor. Covers identification of toxicants and their sources in the environment; equilibrium partitioning of chemicals between air, water, soil, sediment, and biota using physico-chemical properties; and the transport and transformations of chemicals in air, water, and soil media. Includes case studies of fate and transport of selected toxic chemicals. Cross-listed with CHEM 246, and ENTX 200.

ENSC 203 Human and Ecological Risk Assessment 3 Lecture, 3 hours. Prerequisite(s): ENTX 200, ENTX 201. Focuses on history, theory, and practice of predicting, managing, and communicating potential human health and environmental risks of hazardous chemicals. Reviews fundamental components and explores uncertainties, probabilistic approaches, and real-world challenges of risk analysis. Cross-listed with ENTX 203.

ENSC 204 Fluvial Geomorphology 4 Lecture, 4 hours; two four-hour field trips. Prerequisite(s): graduate standing or consent of instructor. Advanced inquiry into the processes that produce fluvial landforms. The topics of erosion, sediment transport and deposition and their roles in the creation and evolution of river channels, wetlands and floodplains are explored from first principles. Field trips to representative fluvial geomorphic systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ENSC 207 Air Quality Modeling 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CEE 206, ENVE 134, CEE 202; graduate standing; or consent of instructor. Prepares for research and entry-level positions that require knowledge of empirical and deterministic air quality modeling applications. Covers empirical model derivations and applications, box modeling, chemical transport modeling, model evaluation, model sensitivity analysis, and data visualization. Cross-listed with CEE 207.

ENSC 208 Ecotoxicology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A; BIOL 005B; CHEM 008A, CHEM 08LA or CHEM 08HA, CHEM 08HLA; CHEM 008B, CHEM 08LB or CHEM 08HB, CHEM 08HLB; graduate standing; or consent of instructor. Introduction to the impact of chemicals upon ecological systems. Examines the fate and effects of environmental chemicals in various hierarchies of biological organization to learn how to carry out precise and accurate assessments of ecological risk. Cross-listed with ENTX 208.

ENSC 209 Artificial Intelligence in Toxicology and Environmental Health 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. An introduction of fundamental principles and methodology of machine learning and artificial intelligence (AI) to investigate critical research questions within the fields of environmental science. Explores cutting-edge techniques and tools based on machine learning and AI algorithms with applications from toxicology, environmental health, and air pollution. Cross-listed with ENTX 209.

ENSC 210 Integrated Hydrologic Modeling 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENSC 107; ENSC 163 or ENSC 165; graduate standing; or consent of instructor. Explores the principles of surface and subsurface flow for water resources modeling. Provides comprehensive and systematic understanding of hydrologic modeling process, model implementation, optimization, and evaluation. Emphasizes integrated surface water-subsurface water models and movement of water, heat, gases, and chemicals through soil.

ENSC 217 Vadose Zone Processes 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENSC 107; or consent of instructor. Studies physical and mathematical descriptions of transient flow and transport processes in the vadose zone. Emphasizes numerical solutions to equations describing the movement of water, gas, contaminants, and heat including chemical and biological reactions. Explores mathematical models for direct and inverse solutions, spatial heterogeneity, and determination of soil hydraulic properties.

ENSC 218 Isotopes in Ecology and Environmental Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC. Explores the principles and techniques of isotope tracer fractionation and mixing commonly used in ecology and environmental science. Introduces isotope notation, mixing models, and kinetic and equilibrium fractionation concepts. Includes case studies involving stable- and radioisotopes of carbon, nitrogen, oxygen, and sulfur. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 4 units.

ENSC 227 Global Change and the Earth System 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Examines the fundamental principles of Earth system science in the context of global change. Topics include the preindustrial and modern-day Earth system, responses of the Earth's support machinery to human activities, consequences of global change for human well-being, and pathways towards global sustainability.

ENSC 232 Biogeochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. A study of the biogeochemical cycling and exchange of carbon and important nutrients

(N, S, base cations) between the lithosphere, hydrosphere, and atmosphere. Quantitatively describes processes at scales ranging from local to global. Addresses modern concerns about water and atmospheric quality, including global climate change.

ENSC 240 Multiphase Atmospheric Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 135/ENSC 135/ENTX 135; or consent of instructor. Explores chemical transformation of inorganic and organic trace gases in the atmosphere and multiphase processes leading to production and aging of atmospheric aerosols. Also discusses recent literature in the field of tropospheric chemistry and aerosol formation. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ENSC 245 Chemistry and Physics of Aerosols 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 109, CHEM 110B; graduate standing; or consent of instructor. Fundamentals of chemical and physical processes controlling behavior and properties of airborne particles. Topics include particle mechanics; electrical, optical, and thermodynamic properties; nucleation; surface and aqueous-phase chemistry; gas-particle partitioning; sampling; size and chemical analysis; atmospheric aerosols; and environmental effects. Cross-listed with CHEM 245 and ENTX 245.

ENSC 265 Special Topics in Earth and Environmental Sciences 1 to 3 Seminar, 1 to 3 hours. Prerequisite(s): graduate standing. Involves oral presentations and small-group discussions of selected topics in the areas of biogeochemistry, global climate change, geomicrobiology, earth surface processes, and interplanetary life. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes to a maximum of 10 units. Cross-listed with GEO 265.

ENSC 275 Research Seminar in Environmental Sciences 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Involves seminars by faculty, visiting scholars, environmental professionals, and advanced graduate students on current research topics in Environmental Sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENSC 290 Directed Studies 1 to 6 Consultation, 1 to 3 hours; individual study, 1 to 15 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual study of selected topics in Environmental Sciences under faculty direction. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENSC 292 Concurrent and Advanced Studies 1 to 4 written work, 1 to 4 hours; individual study, 1 to 4 hours; research, 1 to 4 hours. Prerequisite(s): graduate standing or consent of instructor; Designed to allow graduate students to receive specialized training in fields not covered by current graduate courses. Elected concurrently with 100-series courses in Environmental Sciences, or other upper division courses on an individual basis. Devoted to one or more graduate projects expanding on materials covered in the 100-series course. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 12 units.

ENSC 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Individual research performed under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENSC 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing or consent of instructor. Research in environmental sciences for the M.S. thesis or Ph.D. dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

ENSC 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 hours. Prerequisite(s): graduate standing Supervised teaching in Environmental Sciences or related courses. Required of all teaching assistants in Environmental Sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ENSC 401 Professional Development in Environmental Sciences 2 Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Introduces students to strategies for successful graduate study and early career development. Consists of lectures, discussions and presentations covering research and professional ethics, grant/fellowship writing, and preparation of technical journal articles. Addresses effective job search skills, including preparation of curriculum vitae, networking, effective oral presentations, and job interviews. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.

Environmental Toxicology

Subject abbreviation: ENTX
College of Natural and Agricultural Sciences

Linlin Zhao, Ph.D. Progran Director and Graduate Advisor for Admissions
Joseph Genereux, Ph.D. Graduate Advisor for Enrolled Students
Program Office, 1140 Batchelor Hall
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Professors

Julia Bailey-Serres, Ph.D. *Distinguished Professor, Genetics* (Botany and Plant Sciences)
Roya Bahreini, Ph.D., *Air Quality* (Environmental Sciences)
Chia-en Chang, Ph.D., Bioinformatics (Chemistry)
Quan "Jason" Cheng, Ph.D. *Analytical Toxicology* (Chemistry)
Carl F. Cranor, Ph.D. *Distinguished Professor, Regulation of Toxic Substances* (Philosophy)
Margarita C. Currás-Collazo, Ph.D. *Neurosciences* (Molecular, Cell & Systems Biology)
Adler R. Dillman, Ph.D., *Evolutionary Biology and Microbiology* (Nematology)
Li Fan, Ph.D. *DNA Repair and Replication* (Biochemistry)
Jianying "Jay" Gan, Ph.D. *Distinguished Professor, Water Quality* (Environmental Sciences)
Russ Hille, Ph.D. *Mechanisms of Oxidoreductase Enzymes* (Biochemistry)
Richard J Hooley, Ph.D., Chemistry
Ryan Julian, Ph.D. *Chemistry* (Chemistry)
Xuan Liu, Ph.D. *Transcription Regulation* (Biochemistry)
Ernest Martinez, Ph.D. *Molecular Biology* (Biochemistry)
Manuela Martins-Green, Ph.D. (Molecular, Cell & Systems Biology)
Ashok K. Mulchandani, Ph.D. *Distinguished Professor, Biosensors* (Chemical and Environmental Engineering)
Nicole I. zur Nieden, Ph.D. *Embryonic Stem Cells* (Molecular Cell and Systems Biology)
Constance Nugent, Ph.D. *Telomere Replication* (Cell Biology and Neuroscience)
Mihri Ozkan, Ph.D. *Nanoelectronics and Nanoprobes* (Electrical and Computer Engineering)
Daniel Schlenk, Ph.D. *Aquatic Ecotoxicology* (Environmental Sciences)
Mario Sims, Ph.D., *Epidemiology* (Social Medicine, Population and Public Health)
Frances M. Sladek, Ph.D. *Transcriptional Regulation* (Molecular, Cell & Systems Biology)
Jikui Song, Ph.D. *Biophysics* (Biochemistry)
Prudence Talbot, Ph.D. *Cell Biology* (Molecular, Cell & Systems Biology)
John Trumble, Ph.D. *Distinguished Professor, Integrated Pest Management* (Entomology)
David Volz, Ph.D., *Environmental Health & Toxicology* (Environmental Sciences)
Yinsheng Wang, Ph.D. *Distinguished Professor, Biological Mass Spectrometry* (Chemistry)
Changcheng Zhou, Ph.D., *Atherosclerosis and Metabolic Disorders* (Biomedical Sciences)

Professors Emeriti

Michael F. Allen, Ph.D. *Plant Pathology/Biology* (Plant Pathology)
David E. Crowley, Ph.D. *Environmental Microbiology* (Environmental Sciences)
David A. Eastmond, Ph.D. *Toxicology* (Cell Biology and Neuroscience)
Sarjeet S. Gill, Ph.D. *Toxicology* (Cell Biology and Neuroscience)
William Jury, Ph.D., Soil Physics (Physics)
Marylynn V. Yates, Ph.D. *Environmental Microbiology* (Environmental Sciences)

Associate Professors

Gregor Blaha, Ph.D., *RNA Polymerase and Ribosomes* (Biochemistry)
James Davies, Ph.D., *Environmental Aerosol* (Chemistry)
Emma W Gachomo, Ph.D., (Microbiology & Plant Pathology)
Joseph Genereux, Ph.D., *Proteomics* (Chemistry)
Andrew B. Gray, Ph.D., *Hydrology and Geomorphology* (Environmental Sciences)

Ying-Hsuan Lin, Ph.D., *Atmospheric Transformation* (Environmental Sciences)
Haizhou Liu, Ph.D., *Environmental Chemistry* (Chemical and Environmental Engineering)
Jinyong Liu, Ph.D., *Water Quality Systems Engineering* (Chemical and Environmental Engineering)
Yujie Men, Ph.D., *Environmental Microbiology* (Chemical and Environmental Engineering)
Sean O'Leary, Ph.D., *Translation* (Biochemistry)
Haofei Zhang, Ph.D., *Atmospheric Organic Aerosol* (Chemistry)
Linlin Zhao, Ph.D., *Genetic and Mitochondrial Toxicity (Chemistry)*
Sika Zheng, Ph.D., *RNA Biology* (Biomedical Sciences)

Assistant Professors

Garret R. Anderson, Ph.D., (Molecular, Cell & Systems Biology)
Sihem Cheloufi, Ph.D., *Epigenetics* (Biochemistry)
Wei-Chun Chou, Ph.D. *Pharmacokinetic (PBPK) Modeling, Machine Learning, and Artificial Intelligence*
Sachiko Haga-Yamanaka, Ph.D., *Brain Function and External Stimuli* (Molecular, Cell & Systems Biology)
Jernej Murn, Ph.D., (Biochemistry)
Daniel Petras (Biochemistry)
Samantha Ying, Ph.D., *Soil Biogeochemistry* (Environmental Sciences)

Graduate Program

The program offers the M.S. and Ph.D. degrees in Environmental Toxicology.

The interdepartmental graduate program in Environmental Toxicology has participating faculty from the departments of Biochemistry, Biomedical Sciences, Botany and Plant Sciences, Molecular, Cell, and Systems Biology, Chemical and Environmental Engineering, Chemistry, Entomology, Electrical and Computer Engineering, Environmental Sciences, Philosophy, and Microbiology and Plant Pathology

The goal of the program is to train toxicologists capable of directing research in areas of environmental toxicology. Areas of specialization include biochemical toxicology and chemical toxicology. To attain this goal, a three-tiered curriculum has been designed whereby students must complete

1. A core of courses in environmental toxicology: ENSC 200/ENTX 200/CHEM 246, ENTX 201, ENTX 201L, ENTX 202, ENTX 270
2. A selection of elective courses in environmental toxicology and other relevant fields chosen in consultation with the student's major professor and the Guidance Committee to develop depth in particular areas of specialization
3. Research training in specific areas of environmental toxicology

The program stresses the importance of innovative and independent laboratory research as the major component of the student's education.

Admission

Students must have a B.A. or B.S. degree from an accredited institution and an academic record that satisfies the minimum admission standards established by the UCR Graduate Division. In addition, students applying to the M.S. and Ph.D. program may submit GRE General Test scores (verbal, quantitative, and analytical), but it is not a requirement. Although no specific undergraduate degree specialization is required, applicants should have adequate backgrounds in the basic physical sciences such as chemistry, physics, and mathematics as well as in the biological sciences.

Course Work

Normally, students admitted to regular standing have satisfied all prerequisite course work. Under special circumstances, students who have not completed all undergraduate requirements may be admitted provided that these deficiencies are corrected early in their graduate studies. Deficiencies must be corrected by taking the appropriate course work if undergraduate or other previous training has not included the following:

- One year of general biology
- One year of general physics
- One year of calculus
- One year of general chemistry
- One year of organic chemistry
- One upper division course in general biochemistry
- One upper division course in molecular biology
- One upper division course in statistics

Students who meet all the undergraduate entrance requirements should be able to complete the core Environmental Toxicology requirements in the first year and most electives by the end of the second year.

Professional Development

Students receive trainings on writing and oral presentation by completing an annual progress report, and giving an oral presentation on their research at the Annual Student Symposium (part of the ENTX 271 course). Students in their fourth year of the program give an oral presentation as part of the ENTX 270 seminar series. They complete Teaching Assistant Training through a workshop offered by Graduate Division. They attend special seminars (part of the ENTX 270) given by speakers from industry, government agencies, or other professions on career and professional development, and other special topics relevant to professional development, including research integrity and lab safety.

Laboratory Rotation

All students participate in laboratory rotation through enrollment in ENTX 201L. Students spend time in one laboratory per quarter familiarizing themselves with research techniques utilized in the laboratory of an Environmental Toxicology faculty member. Rotation laboratories are chosen in consultation with the graduate advisor and individual faculty members. Students may enroll in up to three quarters of laboratory rotation before declaring a major professor. Students who wish to declare a major professor after one quarter are not required to enroll for additional laboratory rotation. The major professor serves as chair of the student's Guidance and Dissertation committees.

Guidance Committee

Each graduate student establishes a guidance committee which participates in the annual student progress evaluation procedure and advises the student on curriculum and research. The committee consists of the major professor plus at least two other faculty, one of whom must be a member of the Environmental Toxicology Program. Each student, in consultation with the major professor, nominates the members of the guidance committee. The committee must be named by the end of the quarter in which the student selects a major professor. The composition of the guidance committee must be approved by the curriculum and student affairs committee.

Master's Degree

The program offers the M.S. degree in Environmental Toxicology.

Students enrolling in the master's degree program must meet the requirements for the Plan I or Plan II of the UCR Graduate Council, and take core courses as described above. Plan I also requires submission of an acceptable thesis and an oral examination as described in details below.

Plan I (Thesis)

Thirty-six (36) units, of which 24 must be in graduate-level courses, are required. No more than 12 units of ENTX 290, ENTX 297, and ENTX 299 may be used to satisfy the unit requirement. All students must enroll in the Environmental Toxicology seminar (ENTX 270 and ENTX 271) each quarter offered, although no more than 3 units from seminar courses can be accrued towards degree credit. A final draft of the thesis is to be given to the thesis committee two weeks before the final oral examination. A final oral examination consists of an open research seminar, presented by the candidate and advertised to all the students and faculty in the Environmental Toxicology Program. Following the seminar, the student is questioned by the guidance committee on the thesis research and on matters related to the general field of the thesis research.

Plan II (Comprehensive Examination)

Thirty-six (36) units, of which 18 must be in graduate-level courses, are required. No more than 12 units of ENTX 290 and ENTX 297 may be used to satisfy the unit requirement. All students must enroll in the Environmental Toxicology seminar (ENTX 270 and ENTX 271) each quarter offered. A comprehensive examination is also required, with the content determined and approved by both the Graduate Advisor and the Director of the program.

Normative Time to Degree

6 quarters

Doctoral Degree

The program offers the Ph.D. degree in Environmental Toxicology.

Students must meet general university requirements of the Graduate Division as found in the Graduate Studies section of this catalog.

Course Work

Beyond the required core sequence, all students must enroll in the Environmental Toxicology seminar (ENTX 270 and ENTX 271) each quarter offered and complete a program of courses to be approved by the guidance committee. With the approval of the Graduate Advisor, students defending in spring will be allowed to waive the ENTX 271 registration requirement since this seminar is only offered each spring quarter. All course work schedules are submitted to the graduate advisor for approval. The Ph.D. degree is awarded when the student passes the preliminary and qualifying examinations and demonstrates an ability to do original research by preparation and submission of an acceptable dissertation.

Preliminary Examination

The preliminary examination is a standardized, written test generally offered once a year prior to the beginning of the fall quarter. Students normally take it following the completion of the core curriculum. The examination must be satisfactorily completed in order to enroll for the seventh academic quarter in the Ph.D. program. The examination consists of questions related to environmental, organismal and suborganismal aspects of toxicology. These questions are designed to test the student's ability to synthesize and integrate concepts in toxicology, rather than merely reiterate the material covered in the Environmental Toxicology core curriculum. The examination is administered by a committee consisting of the faculty members involved in teaching the core curriculum. On the basis of the results of this examination, the committee recommends appointment of a faculty qualifying committee, additional course work in specific area(s) of weakness, transfer to a terminal master's program, or withdrawal from the program. In exceptional circumstances, the preliminary examination can be taken a second time.

Oral Qualifying Examination

The qualifying examination is an oral examination conducted by the qualifying committee. The qualifying committee, appointed by the graduate dean from nominations made by the faculty, is composed of the student's major professor and four additional members, one of whom must be from outside the Graduate Environmental Toxicology group. It covers the student's area of specialization and research field as well as general subjects at the discretion of the qualifying committee. The qualifying examination must be successfully completed by the end of the ninth quarter of full-time enrollment in the Ph.D. program. Under exceptional circumstances, the qualifying examination may be taken a second time. Upon successful completion of the qualifying examination, the student is advanced to candidacy.

Dissertation and Final Oral Examination

A dissertation committee composed of at least three members is appointed by the graduate dean shortly after advancement to candidacy. Students must submit a dissertation based on independent, original research acceptable to all dissertation committee members. A final draft of the dissertation is to be given to the committee two weeks before the dissertation defense seminar.

Before approval of the dissertation, students must present their research orally at a thesis defense seminar. The seminar must be advertised to the campus community and is open to all who wish to attend. Following the seminar, the student is questioned by the dissertation committee on the thesis research and on matters related to the general field of the thesis research.

Oral Qualifying Exam and Final Defense Modality

The student and committee members should be present on campus. Students are encouraged to find committee members who are available to attend in person. If that is not possible, upon approval of the examining committee chair, the exam can be taken in the Hybrid mode. If Hybrid is chosen, the student is expected to be on campus in a video enabled room, with the majority of the committee members being physically present and others remote. The chair of the committee must be physically present for a Hybrid exam.

Committee members nominated from outside the UC Academic Senate who participate remotely must have qualifications comparable to a UC Academic Senate member and submit a letter of intention and CV. In addition, strong academic justification for inclusion on the committee must be provided by the Graduate Advisor.

Teaching Requirement

Ph.D. students in our program are required to fulfill a two-quarter teaching requirement, which is an important training to prepare our students for teaching and research professions. Under special circumstances, and with the approval of the major professor and program advisor, the student can apply to have this requirement waived.

Normative Time to Degree

15 quarters

Upper-Division Courses

ENTX 101 Fundamental Toxicology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A; BIOL 005B; CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA; CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB; CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC; or consent of instructor. Fundamental concepts relating to the adverse effects of chemical agents. Topics covered include dose-response relationships, absorption, distribution, metabolism, excretion, mechanisms of toxicity, and the effects of selected environmental toxicants on various organ systems. Characterization and assessment of risks are also covered.

ENTX 103 Environmental Pollution and Health 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENSC 001, ENSC 002. Focuses on the history, theory, and practice of assessing, understanding, and mitigating impacts of the natural and built environment on human health. Reviews core disciplines that underpin the field of environmental health as well as case studies from industrialized, emerging, and developing countries around the world. Cross-listed with ENSC 103.

ENTX 125 Pesticide Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 008B, BIOL 005C or CHEM 08HB; CHEM 08LB or CHEM 08HLB. An introduction to the chemistry, modes of action, and use of insecticides, rodenticides, herbicides, and biopesticides from discovery to environmental interactions. Includes genetics of pesticide resistance development, resistance management, government regulation, probit analysis, dilution and calculations of treatment rates, and sustainable pest management. Cross-listed with ENTM 125, and PLPA 125.

ENTX 135 Atmospheric Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB, or consent of instructor; ENSC 102 recommended. Structure of the troposphere and stratosphere; formation of atmospheric ozone; tropospheric NOx chemistry; methane oxidation cycle; phase distributions of chemicals; wet and dry deposition; chemistry of volatile organic compounds; formation of photochemical air pollution; modeling of air pollution and control strategies; stratospheric ozone depletion and global warming. Cross-listed with CHEM 135, and ENSC 135.

ENTX 150 Cancer Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BCH 110HC or BIOL 107A or CBNS 101 (may be taken concurrently with consent of instructor). Explores the origin, development, and treatment of cancer with emphasis on molecular mechanisms. Covers topics such as oncogenes, tumor suppressors, cell cycle and differentiation, AIDS, and hereditary and environmental factors in the development of cancer. Cross-listed with CBNS 150.

ENTX 154 Risk Assessment 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENTX 101; STAT 010; or equivalent; or consent of instructor. An introduction to the basic principles and methods by which health risks associated with exposure to chemical and physical agents are determined. Topics include hazard identification, dose response and exposure assessments, and risk characterization and management. Cross-listed with ENSC 154.

ENTX 200 Fate and Transport of Chemicals in the Environment 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): one year of organic chemistry; graduate standing; or consent of instructor. Covers identification of toxicants and their sources in the environment; equilibrium partitioning of chemicals between air, water, soil, sediment, and biota using physico-chemical properties;

and the transport and transformations of chemicals in air, water, and soil media. Includes case studies of fate and transport of selected toxic chemicals. Cross-listed with CHEM 246, and ENSC 200.

ENTX 201 Principles of Toxicology 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110A or BCH 110HA, BCH 110B or BCH 110HB; or consent of instructor. The structure-activity and dose-response relationships of environmental toxicants; their absorption, distribution, metabolism, and excretion; and evaluation of their toxicity and factors that influence toxicity. Quantitative methods in measuring acute and chronic toxicity.

ENTX 201L Laboratory Rotation 2 Laboratory, 6 hours. Prerequisite(s): restricted to major(s) Environmental Toxicology; graduate standing. Introduction to research techniques in biochemical and chemical toxicology. Includes laboratory time to explore research topics and techniques. Students who present an oral project in the laboratory receive a letter grade; others receive a Satisfactory (S) or No Credit (NC) grade Course is repeatable to a maximum of 6 units.

ENTX 202 Mechanisms of Toxicity 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110C or BCH 110HC or BIOL 107A; ENTX 201; or consent of instructor. Biochemical and physiology mechanisms underlying the toxicity of environmental toxicants. The interaction of toxicants with subcellular components and macromolecules with emphasis on mechanism of action, in particular neurotoxicity of pesticides, chemical carcinogenesis, mutagenesis, and teratogenicity.

ENTX 203 Human and Ecological Risk Assessment 3 Lecture, 3 hours. Prerequisite(s): ENTX 200, ENTX 201. Focuses on history, theory, and practice of predicting, managing, and communicating potential human health and environmental risks of hazardous chemicals. Reviews fundamental components and explores uncertainties, probabilistic approaches, and real-world challenges of risk analysis. Cross-listed with ENSC 203.

ENTX 204 Genome Maintenance and Stability 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BCH110HC or BIOL 107A; BIOL 113 or BIOL 114 or CBNS 101; BIOL 102 is strongly recommendedgraduate standing. Emphasizes chromosome-based processes that maintain genome integrity and ensure accurate genome transmission during cell division. Topics are drawn from the primary literature and include chromatin structure and composition, DNA repair and recombination, telomere function and chromosome maintenance, mitotic chromosome segregation, and checkpoint surveillance mechanisms. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CMDB 204, and BCH 204.

ENTX 205 Biotransformation of Organic Chemicals 4 Lecture, 4 hours. Prerequisite(s): CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA; CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB; BCH 110A; BCH 110B ; BCH 110C or equivalents; or consent of instructor. Explores the catalytic activities and regulatory pathways of Phase I (e.g., cytochromes P450) and Phase II (e.g., Uridine Diphosphate Glucuronosyl-Transferase) enzymes involved in organic chemical biotransformation. Demonstrates the contribution of biotransformation in toxicology.

ENTX 208 Ecotoxicology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A; BIOL 005B; CHEM 008A, CHEM 08LA or CHEM 08HA, CHEM 08HLA; CHEM 008B, CHEM 08LB or CHEM 08HB, CHEM 08HLB; graduate standing; or consent of instructor. Introduction to the impact of chemicals upon ecological systems. Examines the fate and effects of environmental chemicals in various hierarchies of biological organization to learn how to carry out precise and accurate assessments of ecological risk. Cross-listed with ENSC 208.

ENTX 209 Artificial Intelligence in Toxicology and Environmental Health 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. An introduction of fundamental principles and methodology of machine learning and artificial intelligence (AI) to investigate critical research questions within the fields of environmental science. Explores cutting-edge techniques and tools based on machine learning and AI algorithms with applications from toxicology, environmental health, and air pollution. Cross-listed with ENSC 209.

ENTX 245 Chemistry and Physics of Aerosols 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 109, CHEM 110B; or consent of instructor. Fundamentals of chemical and physical processes controlling behavior and properties of airborne particles. Topics include particle mechanics; electrical, optical, and thermodynamic properties; nucleation; surface and aqueous-phase chemistry; gas-particle partitioning; sampling; size and chemical analysis; atmospheric aerosols; and environmental effects. Cross-listed with CHEM 245, and ENSC 245.

ENTX 252 Special Topics in Environmental Toxicology 1 to 3 Seminar, 1 to 3 hours. Prerequisite(s): graduate standing. Involves oral presentations and intensive small-group discussions of selected topics in the area of special competence of each participant Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 20 units.

ENTX 270 Seminar in Environmental Toxicology 1 Seminar, 1 hour. Prerequisite(s): restricted to major(s) Environmental Toxicology; graduate standing. Addresses current research topics in Environmental Toxicology. Includes lectures, oral reports, and discussion by students, faculty, staff and visiting scholars. Students who present a seminar receive a letter grade; other students receive a Satisfactory(S) No Credit grade. Course is repeatable.

ENTX 271 Seminar in Environmental Toxicology 2 Seminar, 15 hours per quarter; individual study, 15 to 20 hours per quarter. Prerequisite(s): graduate standing in Environmental Toxicology. An interdisciplinary seminar consisting of student presentations of original research and discussion of current research topics in environmental toxicology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes to a maximum of 14 units.

ENTX 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate status in Environmental Toxicology. Literature or research topics under direction of the staff. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

ENTX 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate status in Environmental Toxicology Directed research performed towards the development of a dissertation problem or other research performed under the direction of staff. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

ENTX 298I Individual Internship 1 to 12 Written work, 1 to 12 hours; internship, 2 to 24 hours. Prerequisite(s): graduate standing; or consent of instructor. An individual apprenticeship in environmental toxicology or related fields with an approved professional individual or organization and academic work under the direction of an ETOX faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

ENTX 299 Research For Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate status in Environmental Toxicology. Research performed under the direction of a faculty member towards a thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

Ethnic Studies

Subject abbreviation: ETST
College of Humanities, Arts, and Social Sciences

Robert Perez, Ph.D., Chair
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Professors

Edward T. Chang, Ph.D.
Gerald Clarke, M.F.A.
Anthony Macías, Ph.D.
Jennifer Nájera, Ph.D.
Alfonso Gonzales, Ph.D.

Professors Emeriti

Edna M. Bonacich, Ph.D. (Ethnic Studies/Sociology)
Victoria Bomberry, Ph.D.
Paul Green, Ph.D.

Associate Professors

Adrian Felix, Ph.D.
Wesley Leonard, Ph.D.
Robert Perez, Ph.D.
Kehaulani Vaughn, Ph.D.
Emily Hue, Ph.D.

Assistant Professors

William Pruitt, Ph.D.
Keith Miyake, Ph.D.
Charles Sepulveda, Ph.D.
Jasmin Young, Ph.D.

Majors

Ethnic Studies is the systematic, relational and critical study of the social construction of race, racism, and racial or ethnic subordination, and the history, culture, and contemporary experiences of racial or ethnic groups who have not been fully incorporated into U.S. society. Ethnic Studies is the interdisciplinary social and historical study of how different populations have experienced, survived, and critically engaged the United States nation-building project. We analyze the social dynamics of race, racism, and various forms of institutionalized violence, including land conquest, racist state violence, Spanish and Euroamerican colonialisms, U.S. imperialism, systemic sexual violence, racial genocide, chattel slavery, gendered militarization, legalized discrimination (apartheid and segregation), white supremacy, and the internalized logics of gender/racial domination and assimilation. We are especially engaged with the creative historical work of social movements, cultural and artistic productions, legal and public policy activisms, indigenous and liberationist epistemologies, community and identity formation, and radical social and political thought. We examine how these different kinds of resistance, persistence, liberation struggle, and radical knowledge production both confront and transform oppressive conditions and create new possibilities for social change.

Individually and collectively, courses in Ethnic Studies forge strong scholarly and intellectual connections between the related fields of Native American, African American, Chicana/o, and Asian American Studies. Ethnic Studies is committed to scholarly excellence, intellectual rigor, and making critical contributions to global discourses regarding the meaning of human freedom. As part of our pedagogical philosophy, we strive to provide an empowering literacy that expands students' social and political horizons, as well as the creative, critical thinking skills necessary to participate fully in society and the world.

The Department of Ethnic Studies offers majors leading to a B.A. degree in Ethnic Studies, African American Studies, Asian American Studies, Chicano Studies, and Native American Studies. Students may develop either a general emphasis in Ethnic Studies or a concentration on a specific group. The major enables students to study race and ethnicity in comparative perspective, to gain greater multicultural insight and understanding, and to prepare them to enter the workforce and function effectively and critically as informed citizens in a diverse multicultural society.

With the changing ethnic composition of society is a growing demand for individuals in education, government, and the private sector with knowledge and expertise in race and ethnic relations. An Ethnic Studies major also helps to prepare students for graduate or professional school and careers in a number of areas including education, law, human services, organizing and advocacy, social welfare, urban planning, and state and county government.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The Ethnic Studies Department offers a B.A. degree in Ethnic Studies, African American Studies, Asian American Studies, Chicano Studies, or Native American Studies.

Ethnic Studies Major

The major requirements for the B.A. degree in Ethnic Studies are as follows:

Core courses required of all majors

1. Lower-division requirements (12 units)
   a) ETST 001
   b) Two courses chosen from ETST 002, ETST 003, ETST 005, or ETST 007
2. Upper-division requirements (40 units)
   a) ETST 101A or ETST 101B
   b) ETST 100 or ETST 131
   c) ETST 191R
   d) Three courses chosen from three of the following areas of emphasis:
      (1) African American Studies
      (2) Asian American Studies
      (3) Chicano Studies
      (4) Native American Studies
   e) Four courses chosen from Ethnic Studies courses that are comparative in nature

Note:
No internship courses may be counted toward the upper-division electives in Ethnic Studies.

African American Studies Major

The major requirements for the B.A. degree in African American Studies are as follows:

Core courses required of all majors

1. Lower-division requirements (12 units)
   a) ETST 001
   b) ETST 003
   c) One chosen from ETST 002, ETST 005, or ETST 007
2. Upper-division requirements (40 units)
   a) ETST 101A or ETST 101B
   b) ETST 100 or ETST 131
   c) ETST 109-I and ETST 191R
   d) Sixteen (16) additional upper-division units in Ethnic Studies chosen from courses focusing on the African American experience
   e) A minimum of one Ethnic Studies course chosen from two of the following four areas of emphasis (8 units)
      (1) Asian American Studies
      (2) Chicano Studies
      (3) Native American Studies
      (4) Comparative Issues

Note
No internship courses may be counted toward the upper-division electives in Ethnic Studies.

Asian American Studies Major

The major requirements for the B.A. degree in Asian American Studies are as follows:

Core courses required of all majors

1. Lower-division requirements (12 units)
   a) ETST 001
   b) ETST 005
   c) One chosen from ETST 002, ETST 003 or ETST 007
2. Upper-division requirements (40 units)
   a) ETST 101A or ETST 101B
   b) ETST 100 or ETST 131
   c) ETST 106 and ETST 191R
   d) Sixteen (16) additional upper-division units in Ethnic Studies chosen from courses focusing on the Asian American experience
   e) A minimum of one Ethnic Studies course chosen from two of the following four areas of emphasis (8 units)
      (1) African American Studies
      (2) Chicano Studies
      (3) Native American Studies
      (4) Comparative Issues

Note
No internship courses may be counted toward the upper-division electives in Ethnic Studies.

Chicano Studies Major

The major requirements for the B.A. degree in Chicano Studies are as follows:

Core courses required of all majors

1. Lower-division requirements (12 units): ETST 001, ETST 002 and ETST 004/HIST 004
2. Upper-division requirements (40 units)
   a) ETST 100A or ETST 101B
   b) ETST 100 or ETST 131
   c) ETST 191R
   d) Four courses selected from two of the following areas of emphasis (16 units):
      (1) Law
      ETST 145/SOC 145, ETST 126, ETST 128/SOC 128, ETST 185, ETST 108-I
      (2) Politics
      ETST 123, ETST 125, ETST 111, ETST 132, ETST 142, ETST 156
      (3) History and Culture
      ETST 155, ETST 108E, ETST 108F, ETST 108-I, ETST 108P, ETST 122, ETST 125, ETST 128/SOC 128, ETST 146/EDUC 146, ETST 153/LNST 153, ETST 154, ETST 161, ETST 166
      (4) Gender
      ETST 124, ETST 114, ETST 127, ETST 175/GSST 175
   e) One Senior Research Seminar (4 units)
   f) One Internship course (4 units)
   g) One additional elective upper-division course in Ethnic Studies

Note

No internship courses may be counted toward the upper-division electives in Ethnic Studies.

Native American Studies Major

The major requirements for the B.A. degree in Native American Studies are as follows:

Core courses required of all majors

1. Lower-division requirements (12 units)
   a) ETST 001
   b) ETST 007
   c) One chosen from ETST 002, ETST 003 or ETST 005
2. Upper-division requirements (40 units)
   a) ETST 101A or ETST 101B
   b) ETST 100 or ETST 131
   c) ETST 157, ETST 158 and ETST 191R
   d) Sixteen (16) additional upper-division units in Ethnic Studies chosen from courses focusing on the Native American experience
   e) One Ethnic Studies course chosen from one of the following four areas of emphasis (4 units)
      (1) African American Studies
      (2) Asian American Studies
      (3) Chicano Studies
      (4) Comparative Issues

Note

No internship courses may be counted toward the upper-division electives in Ethnic Studies.

Minors

The Ethnic Studies minor consists of 4 lower-division units, 20 upper-division units, and appropriate prerequisites as needed.

1. Lower-division requirement (4 units): ETST 001
2. Upper-division requirements (20 units)
   a) ETST 100, ETST 131
   b) Twelve (12) additional upper-division units in Ethnic Studies courses that are either comparative in nature or focus on African Americans, Asian Americans, Chicanos, or Native Americans (Courses must be approved by Ethnic Studies advisor.)

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

African American Studies Minor

The African American Studies minor consists of 4 lower-division units, 20 upper-division units, and appropriate prerequisites as needed.

1. Lower-division requirement (4 units): ETST 003
2. Upper-division requirements: 20 additional upper-division units in Ethnic Studies chosen from courses focusing on African Americans

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Asian American Studies Minor

The Asian American Studies minor consists of 4 lower-division units, 20 upper-division units, and appropriate prerequisites as needed.

1. Lower-division requirement (4 units): ETST 005
2. Upper-division requirements: 20 additional upper-division units in Ethnic Studies chosen from courses focusing on Asian Americans

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Chicano Studies Minor

The Chicano Studies minor consists of 4 lower-division units, 20 upper-division units, and appropriate prerequisites as needed.

1. Lower-division requirement (4 units): ETST 002 or ETST 004/HIST 004
2. Upper-division requirements: 20 additional upper-division units in Ethnic Studies chosen from courses focusing on Chicanos

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Native American Studies Minor

The Native American Studies minor consists of 4 lower-division units, 20 upper-division units, and appropriate prerequisites as needed.

1. Lower-division requirement (4 units): ETST 007
2. Upper-division requirements: 20 additional upper-division units in Ethnic Studies chosen from courses focusing on Native Americans

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Graduate Program

The Department of Ethnic Studies offers M.A. and Ph.D. degrees in the interdisciplinary field of Ethnic Studies.

Admission

For the M.A. and Ph.D. degrees, students are admitted for the fall quarter of each academic year only. The basic requirement for admission into the programs is a bachelor's degree or its equivalent from an accredited institution with a major in any subject field.

Admission to the graduate program is based on the following criteria:

1. Prior academic performance, especially in undergraduate or graduate classes in Ethnic Studies or related fields.
2. Letters of recommendation from at least three persons familiar with an applicant's potential for achieving academic excellence. Two of the letters must be from professors in the applicant's major subject.
3. Compatibility between applicant's areas of interest and department's reserach and teaching emphases.
4. Quality of the writing sample. Applicants must submit a scholarly paper, at least 10 double spaced pages, but no more than 25 double spaced pages, such as a term paper, section of a thesis, or published work.
5. Completed application and materials (including transcripts) required from Graduate Division.

The Ethnic Studies website at ethnicstudies.ucr.edu provides more details on the Ph.D. program, degree requirements, and application procedures. General Graduate Division

university requirements are available on the Graduate website at graduate.ucr.edu/ and in the Graduate Studies section of this catalog.

Master's Degree

The M.A. degree program is designed for students whose goal is to complete the M.A. as their ultimate objective. While completion of the M.A. degree does not lead to automatic admission into the Ph.D. program, successful students may be encouraged to apply to the Ethnic Studies Ph.D. program at UCR or to similar programs at peer campuses. The M.A. program is designed for students who wish to enhance their existing scholarly training and enhance their professional qualifications, or who hope to prepare themselves for admission into a relevant Ph.D. program.

Coursework

All students must complete the M.A. core curriculum. The minimum course unit requirement for completion of the M.A. is 36.

Course Requirements

The core Ethnic Studies M.A. graduate curriculum consists of two theory courses (ETST 200 and 201), and one methodology course (ETST 203). The remainder of each M.A. student's specific curricular program is structured in consultation with his or her assigned faculty mentor. The candidate must complete a minimum of 36 units of course work with a cumulative grade point average of 3.0 or better, which include the three core courses and at least 24 additional units in 200-series courses. At least 12 of these 24 additional units must be in Ethnic Studies. These courses cannot include ETST 297 or ETST 299. Eight (8) units of 100-series courses may be counted toward the unit requirement with the permission of the graduate advisor.

M.A. Completion

Plan II (Comprehensive Examination)

Graduate students are required to successfully complete a Written M.A. Examination by the end of their second year. The exam will test the student's knowledge of the methodological and theoretical foundations of the field of Ethnic Studies and will cover material from the required core courses as well as courses in the student's area(s) of specialization. This exam is evaluated by a faculty committee of the candidate's choosing. If the student passes this exam, the committee will recommend awarding of the M.A. degree in Ethnic Studies.

Normative Time to Degree:

Six quarters.

Doctoral Degree

The Department of Ethnic Studies offers the Ph.D. degree in the interdisciplinary field of Ethnic Studies. Students proceed through the graduate program from coursework to exams to fieldwork and writing the dissertation. The Ph.D. program prepares students for teaching and research careers in the private and public sector.

Coursework

All students, including those who have a master's degree at the time of admission, must complete the basic core curriculum.

Course Requirements

The core Ethnic Studies graduate curriculum consists of two theory courses (ETST 200 and 201), one methodology course (ETST 203), and a graduate proseminar on professionalization (ETST 405). Where appropriate, students are encouraged to take an additional course in methodology (quantitative or qualitative), in addition to ETST 203. Students are also required to enroll in and attend the Ethnic Studies Colloquium during each quarter of the first two years of graduate work.

During the second year students will begin to select courses that are relevant to one or more of the following areas of specialization:

Area I: Theories of Race and Power

Area II: Cultural Politics and Production

Area III: The State, Law, and Social Transformation

Students are also encouraged to supplement regular curricular offerings by initiating individual or small-group reading courses with appropriate Ethnic Studies faculty (ETST 290's etc.) or with cooperating faculty in other CHASS departments.

First-year core requirements:

ETST 200 (Fall) History of Ideas in Ethnic Studies

ETST 201 (Winter) Contemporary Theories in Ethnic Studies

ETST 203 (Spring) Methodologies in Ethnic Studies

ETST 289 (Fall, Winter, Spring) Departmental Colloquium

Second-year core requirements:

ETST 289 (Fall, Winter, Spring) Departmental Colloquium

ETST 405 (Fall) Graduate Proseminar on Professionalism

Research and Teaching Requirements

A student's program must include at least one academic quarter of supervised research through enrollment in ETST 297 and/or by working as a research assistant. The equivalent of at least one academic quarter of college classroom teaching is also required of all students.

Grades

A student must complete courses in the core curriculum and the specialization areas with a grade of "B" or better in each course.

Ph.D. Written and Oral Qualifying Examinations

Written Qualifying Examination

Graduate students are required to successfully complete a Written Qualifying Examination by the end of the spring quarter of their second year. The exam will test the student's knowledge of the methodological and theoretical foundations of the field of Ethnic Studies and will cover material from the required core courses as well as courses in the student's area(s) of specialization. This exam is evaluated by a faculty committee. If the student passes this exam, the committee will recommend awarding of the M.A. degree in Ethnic Studies. If the M.A. is awarded, or if the student already has an M.A. in Ethnic Studies, the faculty then votes on whether or not the student should continue in the Ph.D. program.

Oral Qualifying Examination

Students must compose, in consultation with a committee consisting of three to four faculty members, three written field statements that pertain to theoretical, methodological, and substantive foci related to the preparation of their dissertation.

Graduate students are required to successfully complete an Oral Qualifying Examination by the end of the winter quarter of their third year in which the student must display mastery over his/her three fields. If the oral exam is passed, the student will advance to candidacy.

Dissertation Prospectus

The Ph.D. candidate must also submit, no later than the fall quarter of their fourth year, a written prospectus outlining the topic, thesis, methods, resources, and timeline for the completion of the dissertation. The candidate must hold a Prospectus Meeting with Dissertation Committee members for final approval of the dissertation prospectus.

Foreign Language

Requirement There is no formal language requirement. However, in certain research areas a language requirement may be required if it is deemed that the language is germane to the student's research. In those cases where foreign language is required, competency can be established either by presenting evidence of satisfactory completion of the UCR Language Placement Exam, or by means of a translation test administered by the Graduate Affairs Committee.

Dissertation and Defense

Doctoral students who have advanced to candidacy will research and write a dissertation under the guidance of a Dissertation Committee. The dissertation should focus on a specific aspect of the candidate's fields of study, and must conform to the format prescribed by the Graduate Council. After the Dissertation Committee approves the completed dissertation, the candidate must formally present his/her dissertation as part of the Departmental Colloquium series to fulfill the Dissertation Defense requirement.

Publicity

The Dissertation Defense will be a public event and will be advertised as would a departmental speaker. Room reservations must be made in advance in consultation with the Graduate Student Affairs Officer.

The Dissertation Defense can be completed in one of the following modes: In-Person or Hybrid. The student and their advisor will discuss which mode is appropriate, with the advisor making the final determination. For In-Person modality, the student is required to hold the Dissertation Defense on campus with all committee members physically present. For Hybrid modality, the student is required to hold the Dissertation Defense on campus in a video enabled room that supports some members physically present and others remote. The student and their chair of the dissertation committee must be present on campus for the Hybrid Option.

Normative time to degree:
The normative time for completion of the Ph.D. degree is six years.

Lower-Division Courses

ETST 001 Introduction to the Study of Race and Ethnicity 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces major concepts and controversial issues in the study of race and ethnicity. Provides a general overview of topics that are covered in more specialized Ethnic Studies courses. Credit is awarded for one of the following ETST 001 or ETST 001H.

ETST 001H Honors Introduction to the Study of Race and Ethnicity 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors; or consent of instructor. Honors course corresponding to ETST 001. Introduces major concepts and controversial issues in the study of race and ethnicity. Provides a general overview of topics that are covered in more specialized Ethnic Studies courses. Credit is awarded for one of the following ETST 001H or ETST 001.

ETST 002 Introduction to Chicano Studies in Comparative Perspective 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Provides an overview of the Chicano experience from 1848 to the present. Compares and contrasts the Chicano experience with the experiences of the dominant society and those of other racial and ethnic groups. Credit is awarded for one of the following ETST 002 or ETST 002H.

ETST 002H Honors Introduction to Chicano Studies in Comparative Perspective 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors. Honors course corresponding to ETST 002. Provides an overview of the Chicano experience from 1848 to the present. Compares and contrasts the Chicano experience with the experiences of the dominant society and those of other racial and ethnic groups. Credit is awarded for one of the following ETST 002H or ETST 002.

ETST 003 Introduction to African American Studies in Comparative Perspective 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Provides an overview of the Black experience in the United States from antiquity to the present. Employs historical and interdisciplinary perspectives. Emphasizes the Black experience in a world context.

ETST 004 Introduction to Chicano History 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers the historical heritage of the Chicano from Spanish and Indian origins to the Chicano movement. Emphasizes the period since 1845. Cross-listed with HIST 004.

ETST 005 Introduction to Asian American Studies in Comparative Perspective 4 Lecture, 3 hours; discussion, 1 hour. Provides an overview of the Asian experience in the United States. Covers the period from the mid-nineteenth century immigration to Hawaii and the U.S. Pacific coast to the present. Compares and contrasts the Asian experience with that of African Americans and Chicanos/Latinos. Credit is awarded for one of the following ETST 005 or ETST 005H.

ETST 005H Honors Introduction to Asian American Studies in Comparative Perspective 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors; or consent of instructor. Honors course corresponding to ETST 005. Provides an overview of the Asian experience in the United States. Covers the period from the mid-nineteenth century immigration to Hawaii and the U.S. Pacific coast to the present. Compares and contrasts the Asian experience with that of African Americans and Chicanos/Latinos. Credit is awarded for one of the following ETST 005H or ETST 005.

ETST 007 Introduction to Native American Studies in Comparative Perspective 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Provides an overview of the Native American experience in the United States from antiquity to the present. Compares and contrasts the Native American experience with the experiences of the dominant society and those of other racial and ethnic groups. Credit is awarded for one of the following ETST 007 or ETST 007H.

ETST 007H Honors Introduction to Native American Studies in Comparative Perspective 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors; or consent of instructor. Honors course corresponding to ETST 007. Provides an overview of the Native American experience in the United States from antiquity to the present. Compares and contrasts the Native American experience with the experiences of the dominant society and those of other racial and ethnic groups. Credit is awarded for one of the following ETST 007H or ETST 007.

ETST 008 Introduction to Chicano Cultural Studies 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. Identifies the cultural process of the Chicano experience, beginning with the Chicano Movement, and discusses the ideas, beliefs, values, and the forms of consciousness that shaped this process. Introduces literary and cultural works such as essay, film, theatre, music, poetry, and art.

ETST 011 Language and Ethnicity in the Usa 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces the changing demographic, sociopolitical, and ideological issues surrounding language in the United States through an ethnic studies lens. Topics include the history of languages in the United States; language usage patterns; language policy; language and power; language rights; and how language is linked to individual, ethnic, and national identities.

ETST 012 Religious Myths and Rituals 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; and images of transcendence. Examines religious beliefs and expressions from diverse cultural perspectives. Utilizes materials from indigenous Native (North and South) American, African American, and/or Asian American religions. Cross-listed with RLST 012. Credit is awarded for only one of ETST 012/RLST 012 or ETST 012H/RLST 012H.

ETST 012H Honors Religious Myths and Rituals 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to ETST 012/RLST 012. An introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; images of transcendence; and understanding religious beliefs and expressions from diverse cultural perspectives. Utilizes source materials from indigenous Native (North and South) American, African American, and/or Asian American religions. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with RLST 012H. Credit is awarded for only one of ETST 012/RLST 012 or ETST 012H/RLST 012H.

ETST 014 Popular Musics of the World 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to issues surrounding popular and urban musics of the world focusing on three major geocultural areas: Africa, Asia, and the Americas. Emphasizes the relationship between mass-mediated music and issues of cultural hegemony, resistance, and subversion. Analyzes the cultural impact of media technology on music performance and reception. Cross-listed with MUS 014, and URST 014.

ETST 098 Introduction to Arab/Muslim American Studies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Provides an overview of themes in Arab and Muslim American studies. Includes immigration and racism; family, gender, and sexuality; socio-economic class; religious affiliations; arts and cultures; and politics and political activism. Utilizes with interdisciplinary materials from social media and film to anthropological, historical, sociological, cultural, and literary texts.

Upper-Division Courses

ETST 100 Race and Ethnicity in A Comparative Perspective 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 001. Explores the interrelationships between race, class, ethnicity, and the operation of social processes. Accordingly, readings for this course center on the comparative well-being of African Americans, Hispanics (especially Chicanos), Native Americans, and Asian Americans.

ETST 101A Historical Development of Race and Power 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 001 or ETST 001H or ETST 002 or ETST 002H or ETST 003 or ETST 004 or HIST 004 or ETST 005 or ETST 005H or ETST 007 or ETST 007H or ETST 008 or ETST 011 or ETST 012 or RLST 012 or ETST 012H or RLST 012H or ETST 014 or MUS 014 or URST 014 or ETST 098 or ETST 102; restricted to class level standing of junior, or senior; or consent of instructor. Focuses on a critical historical charting of the

political, economic, and cultural development of race and power.

ETST 101B Theories of Race and Power 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 001 or ETST 001H or ETST 002 or ETST 002H or ETST 003 or ETST 004 or HIST 004 or ETST 005 or ETST 005H or ETST 007 or ETST 007H or ETST 008 or ETST 011 or ETST 012 or RLST 012 or ETST 012H or RLST 012H or ETST 014 or MUS 014 or URST 014 or ETST 098 or ETST 102; restricted to class level standing of junior, or senior; or consent of instructor. Focuses on specific theories of race, dominance, and resistance. Recognizes the central structuring debates about social formation and social change.

ETST 102 The Political Economy of Race and Class 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. This course explores the interrelationships among race, class, ethnicity, and the operation of market processes. Readings for this course will center on the comparative economic well-being of African Americans, Chicanos, Asian Americans, and Native Americans.

ETST 103 Histories of Chicano/A Education 4 Lecture, 3 hours; research, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): upper- division standing; ETST 002 is recommended. Examines the prevalence of racial segregation of Mexican origin students in U.S. schools, Americanization programs, and community responses to such endeavors in the first half of the twentieth century. Explores the Chicano/a movement's impact on education throughout the Southwest. Notes the various strategies employed by activists and community members to affect the Chicano/a generation's education.

ETST 105A History of Black Americans: West African Backgrounds to 1877 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The study of the experiences of Black people in the United States with emphasis on the ideas and institutions that have shaped those experiences from the period of slave trading in West Africa to 1877.

ETST 105B History of Black Americans: 1877-1965 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on the experiences of Black people in the United States with emphasis on the ideas and institutions that have shaped those experiences from 1877 to 1965.

ETST 106 Theory in Asian American Studies 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 001 or ETST 001H or ETST 002 or ETST 002H or ETST 003 or ETST 004 or HIST 004 or ETST 005 or ETST 005H or ETST 007 or ETST 007H or ETST 008 or ETST 011 or ETST 012 or RLST 012 or ETST 012H or RLST 012H or ETST 014 or MUS 014 or URST 014 or ETST 098 or ETST 102; or consent of instructor. Introduces interdisciplinary theories within Asian American Studies to understand and disrupt conditions of dominance within and beyond the Americas. Considers interdependent structures of oppression such as racism, capitalism, heteropatriarchy, transphobia, Orientalism, imperialism, (settler) colonialism, carcerality, antiblackness, ableism, and xenophobia. Emphasizes emergent forms of resistance within Asian American communities.

ETST 108 (E-Z) Special Topics in Chicano Studies 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Selected topics in: I. Mexican Immigration And The Chicano Community; L. The Labor And Legal History Of The Chicano; P. Chicano Poetry And Theatre.

ETST 109 (E-Z) Special Topics in African American Studies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 003; restricted to class level standing of junior, or senior. Selected topics addressing the issues of the African American experience. Includes reading, research, and discussion on the African American experience.

ETST 109I The Black Diaspora: Cultural, Political, and Historical Connections 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 003, upper-division standing; or consent of instructor. Examines the dispersal and evolution of transplanted African populations throughout the world. Emphasis is on the most recent diaspora between 1600 and 1890 when millions of Africans migrated to the Western Hemisphere. The smaller African communities in Asia, Europe, and the Pacific Islands are also examined.

ETST 109J Race, Gender, Power, Knowledge 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 003, upper-division standing; or consent of instructor. Explores race and gender produced and institutionalized in U.S. social arrangements. Emphasizes the social construction of race and gender in science, culture, and law. Surveys a collection of 19th and 20th century scientific and legal texts alongside feminist of color writings that analyze the relationship between knowledge, empowerment, and social justice.

ETST 109K Blackness and Religion 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 003; upper-division standing or consent of instructor. Provides an overview of the theoretical overlaps and intersections of the meanings, origins, and functions of religion in both Africa and the African Diaspora. Topics include the philosophical, theological, and anthropological thought necessary for the concept of religion to cohere as a framework since modernity.

ETST 110 (E-Z) Special Topics in Asian American Studies 1 to 4 Lecture, 1 hour; term paper, 3 hours. Selected topics addressing the issues of the Asian American experience. Reading, research, and discussion on the Asian American experience. G. Community Research: Asian American Community; K. Foreign Policy And Asian Americans.

ETST 112 The Civil Rights Movement, 1950-1970 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The Civil Rights Movement of the 1950s and 1960s. The main focus will be on the "grass roots." African American aspects of "The Movement," as it was popularly known, from school desegregation to voting rights and beyond. Cross-listed with HISA 135.

ETST 113 Black Feminist Theory and Activism 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers the writings and collective organizational strategies of African American women intellectuals and activists developed in response to the ways racial, sexual, and economic oppression work interdependently and are institutionalized. Follows black women's agendas for social change from the early women's slave narratives to the present. Cross-listed with HISA 134.

ETST 114 Contemporary Latina Writing in the United States 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Critical readings of Chicana, Puerto Rican, and Cuban American authors. Overview of contemporary literature (1970 to present) written by Latinas who reside permanently in the United States. Theatre, poetry, and narrative is closely examined and compared. Focuses on the political, historical, social, and cultural processes that gives rise to this literature.

ETST 115 (E-Z) Topics in Native American History 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Selected topics addressing the issues of the Native American. Includes reading, research, and discussion on the Native American experience. F. Erly Amer:emrging Interprettns. Cross-listed with HISA 144 (E-Z).

ETST 116 Medicine Ways of Native Americans 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the medical history of Native Americans. Focuses on traditional Native American medicine and how Western diseases, medical practices, health care, and policies influenced American Indian health. Topics include medicine people, rituals, ceremonies, smallpox, measles, influenza, anomie, accidents, diabetes, suicides, mental illness, and murders. Cross-listed with HISA 147.

ETST 117 (E-Z) Themes and Topics in African History 4 Lecture, 3 hours; term paper, 3 hours. A thematic and topical approach to the study of African history from the early Nile Valley civilizations to the twentieth century. Examines the temporal and spatial development of African societies--including their social, political, economic, and ideological systems--during the precolonial, colonial, and postcolonial periods. F. West African History To 1800; I. Nineteenth- And Twentieth-century Africa And European Imperialism; J. Ancient Africa; K. Africa From

1000-1880; M. Twentieth-century Africa.

ETST 118 American Indian Identities 4 Lecture, 3 hours; written work, 2 hours; field, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Provides a multidisciplinary perspective on the development and diversity of contemporary American Indian identities including the question of who or what counts as "Indian," and why. Topics include historical and contemporary perspectives from political, ethnic, cultural, and legal standpoints from both American Indian communities and wider United States society.

ETST 119 Issues in Twentieth-Century and Contemporary Native American Art 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to twentieth-century and contemporary Native American art. Includes an examination of outside forces that have impacted Native American artists and their work. Topics include colonialist attitudes toward "authenticity", as well as paternalist government policies and economic factors combined with romanticized ideas of the "noble savage".

ETST 121 California Native Cultures 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduces the culture and history of the diverse Indigenous peoples of California. Topics explored include oral histories, traditional ecological knowledge (TEK), material culture, and kinship practices. Discusses contemporary activities of cultural preservation and resistance to assimilation.

ETST 123 Chicano Politics in Comparative Perspective 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of contemporary Chicano politics, political movements, ideologies, relations with intergovernmental agencies, political attitudes, and participation in the political process. Comparison of the Chicano political experience to that of other racial and ethnic groups in American politics.

ETST 124 The Chicana 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The unique experience of the Chicana viewed from social, intellectual, historical, and artistic perspectives.

ETST 126 The Chicano and the Law 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of the relationship of the Chicano to the U.S. legal and judicial system. Topics include traditional sociological and criminological theories; history of the Chicano and the law; the Pachuco image and the Chicano; and police and correctional institutions.

ETST 127 Latino Men and Masculinity 5 Lecture, 3 hours; term paper, 3 hours; written work 3 hours. Prerequisite(s): ETST 001 or ETST 001H or ETST 002 or ETST 002H or ETS,T 003 or ETST 005 or ETST 005H or ETST 007 or ETST 007H or consent of instructor. Analysis of Chicano/Latino men and masculinity in historical and comparative perspective. Examines social construction and expression of manhood and masculinity in a cross-national context and the range and varieties of masculinities in Latino America. Critically evaluates and deconstructs common myths, stereotypes, and misconceptions about men, machismo, and masculinity.

ETST 128 Chicano Sociology 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Analysis of the Mexican experience in U.S. society. Explores the history as a minority; mass immigration in the twentieth century; relationships with American institutions; present socioeconomic status; variations in social status from region to region; political emergence and variations in values; and social relations and integration with non-Mexicans. Cross-listed with SOC 128. Credit is awarded for one of the following SOC 128, ETST 128, ETST 128S, or SOC 128S.

ETST 128S Chicano Sociology 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 4 hours; individual study, 4 hours; written work, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of the Mexican experience in U.S. society. Explores the history as a minority; mass immigration in the twentieth century; relationships with American institutions; present socioeconomic status; variations in social status from region to region; political emergence and variations in values; and social relations and integration with non-Mexicans. Cross-listed with SOC 128S. Credit is awarded for only one of ETST 128/SOC 128 or ETST 128S/SOC 128S.

ETST 130 History of Public Education in Communities of Color 4 Seminar, 3 hours; term paper, 1 hour; research, 2 hours. Prerequisite(s): upper-division standing; consent of instructor. An introduction to a comparative analysis of public education as it relates to Native Americans, African Americans, Latinas/os, Chicanas/os, and Asian Americans. Focuses on experiences within the United States. Compares and contrasts experiences within these groups, as well as identifies major policy disagreements.

ETST 131 Race, Class, and Gender 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ETST 001 or ETST 001H or ETST 002 or ETST 002H or ETST 003 or ETST 005 or ETST 005H or ETST 007 or ETST 007H or ETST 004 or HIST 004 or ETST 008 or ETST 012 or ETST 012H or RLST 012 or RLST 012H or ETST 014 or ETST 011 or ETST 098; or consent of instructor. Considers the interdependency of race, class, gender, and sexuality in relation to social inequality and oppression. Focuses on the intersection of components, as well as examines the experiences and strategies of resistance of poor, working class women of color and/or queer people of color.

ETST 132 Chicano Contemporary Issues 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Provides students with demographic and historical overview of the status of Latinos in the United States today, and of the salient issues plaguing them. Utilizing an interdisciplinary approach, analyzes strategies, tactics, and policies that may effectively deal with these issues.

ETST 133 Asian Diaspora: Historical, Contemporary, and Comparative Perspectives 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the dispersal, transplantation, and transformation of Asian populations in selected regions of the world--the Americas, Europe, the Middle East, and Asia Pacific--as viewed from the historical and contemporary experiences of the Chinese, Japanese, Filipinos, Koreans, Vietnamese, and other Asian groups in the contexts of colonization, cultural and political domination, and an emerging global economy.

ETST 136 The Korean American Experience 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the history of Koreans in the United States to analyze a wide range of contemporary social and identity issues. Students are encouraged to do original research, develop writing and communication skills, and devise research projects that address the immigrant Korean community's needs.

ETST 137 The Vietnamese Americans: the Refugee and Immigrant Experience 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on the Vietnamese American experience in contemporary society. Emphasizes the relationship of Vietnamese Americans to the larger society and on intergenerational strains and conflicts. Topics include socioeconomic and educational problems, family, religion, and the relationship between Vietnamese Americans and other ethnic groups. Cross-listed with SEAS 137.

ETST 139 Contemporary Issues in the Asian American Community 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes contemporary issues facing Asian Americans: Asian American identity and images, education, employment, housing, dual oppression, interethnic conflicts, juvenile delinquency, generational conflicts, and anti-Asian violence.

ETST 140 Asian American Feminist Theory and Politics 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Addresses the shifting role of Asian American women in the United States as they struggle to define their identities between and within diverse and often opposing cultures. Explores and analyzes the myths and realities of being an Asian American woman through literature, art, documents, films, and first-person accounts.

ETST 143 Critical Filipino(a) Studies: Histories and Legacies of United States Conquest, Colonialism,& Empire 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 001 or ETST 001H or ETST 002 or ETST 002H or ETST 003 or ETST 004 or HIST 004 or ETST 005 or ETST 005H or ETST 007 or ETST 007H or ETST 008 or ETST 012 or ETST 012H or RLST 012 or RLST 012H or ETST 014; or consent of instructor. Critically examines and theorizes the historical impact and legacies of U.S. conquest and colonialism in the Philippines. Analyzes the origins of Filipino American civic existence and its links to histories of U.S. racial formation, racialized industrialization, and racialized frontier warfare. Cross-listed with SEAS 143.

ETST 144 Race and Indigeneity in Hawai'i 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ETST 001 (or ETST 001H), ETST 005 (or ETST 005H). A comparative and historical survey of the racial dynamics of Hawaii's multicultural community. Explores the intersections between Hawaii's ethnic groups including the native Hawaiians, the white ("haole") population, and the plantation immigrant groups (Chinese, Japanese, Filipino, and Portuguese). Also addresses the Pacific Islander population in contemporary Hawaii.

ETST 145 Law and Subordination 5 Lecture, 3 hours; field, 6 hours. Prerequisite(s): upper-division standing in Ethnic Studies or Sociology; ETST 128/SOC 128 or ETST 128S/SOC 128. A comparative and historical analysis of subordinated communities and law emphasizing integrating theoretical understanding of racial, class, and gender subordination. Includes field experience working directly with groups that have traditionally lacked equal access to the legal and judicial system. Cross-listed with SOC 145.

ETST 146 Educational Perspectives On the Chicano 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An examination of educational policy issues concerning Chicano students, such as testing and testing procedures, learning styles, socialization, and language acquisition. Other topics will deal with the impact of significant legislative acts related to the education of Chicanos. Cross-listed with EDUC 146.

ETST 147 History of Black Education 4 Lecture, 3 hours; individual study, 4 hours. Prerequisite(s): upper-division standing. This course examines major themes in Black education: the education of slave and free Blacks; role of missionaries and philanthropists in Black education; the growth of Black colleges; curricular debates; and the NAACP challenge of the "separate but equal" doctrine.

ETST 148 Caribbean Culture and Society 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An overview of the Caribbean region from a historical, cultural, and political perspective. Emphasizes contemporary issues affecting the Caribbean and the struggle of its people to maintain their identities. Cross-listed with ANTH 142G, and LNST 168.

ETST 149 Political Violence in Mexico 4 Lecture, 3 hours; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): ETST 001 or ETST 001H or ETST 002 or ETST 002H or ETST 004 or HIST 004 or ETST 008; restricted to class level standing of junior, or senior. A historical analysis of political and state violence in post-revolutionary Mexico from the early twentieth century to the present. Explores cycles of violence across different states and regions as well as their cross-border implications for Mexican communities in the United States.

ETST 153 Native American Language Revitalization 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Provides an overview of Native American language endangerment and revitalization efforts. Includes the changing social contexts in which they occur, focusing on social and political implications. Topics include methods of revitalization, the changing role of linguists and other specialists, and implications of language efforts for identity.

ETST 154 Chicanos and Popular Music in the Twentieth-Century: From Pachuco Boogie to Latin Jazz 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examination of musical styles and expressive cultures of everyday Mexican Americans in primarily Southern California to understand their social consciousness and cultural politics. Covers the historical evolution of diverse Chicano cultural identities, musical tastes, and communities. Focuses on cultural hybridity, subcultural style, identity formation, class mobility, gender, sexuality, racialization, and assimilation.

ETST 155 Chicana/O California: A Social and Cultural History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examination of the historical evolution of Mexican and Mexican American social and cultural experience in California from the Spanish colonial period through the late twentieth century. Analysis of the Chicana/o impact on regional culture and American society as a whole.

ETST 157 Native American Diaspora 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 007, upper-division standing; or consent of instructor. Analyzes historical Native American migrations. Explores involuntary Native American diaspora throughout America forced by interaction with Spanish, French, Dutch, and English colonists. Examines nineteenth- and twentieth-century reservations and forced and voluntary removals and relocations.

ETST 158 American Indian Intellectual Traditions 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes selected spiritual beliefs of America's native peoples. Examines sacred beliefs, oral histories, ceremonies, customs, and the historical significance of selected tribes and bands. Explores the conditions and forces which shaped American Indians and influence them today.

ETST 159 Texas Indian History 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 007 or ETST 007H or HIST 035 or HIST 036 or HIST 037 or consent of instructor. History of the aboriginal peoples of Texas from the earliest times to the present. Examines pre-colonial eras, European invasion, and colonialism under Mexico, the Republic of Texas, and the United States. Discusses the effects of treaties, laws, and federal and state policies on modern Texas Indians. Emphasizes the survival and adaptation of native peoples of Texas.

ETST 160 Community Research and Advocacy 4 Seminar, 3 hours; written work, 1 hour; field, 8 to 10 hours. Prerequisite(s): ETST 145/SOC 145 or consent of instructor. Covers theoretical, practical, and ethical issues associated with community-based research and advocacy. Course is repeatable to a maximum of 8 units.

ETST 161 United States Latinos: Crossing Borders, Crossing Cultures 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the idea of Latino identity as a way to study heterogeneity of ethnic group identification. Focuses on historical chronology, literary tradition, and other cultural practices. Emphasis is on the experience of diversity and pluralism within the Latino experience.

ETST 162 Learning Native American Languages 5 Lecture, 4 hours; individual study, 3 hours; research, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Provides a social situation in which students learn to speak a Native American language of their choice through individual study of reference materials, training in linguistic analysis, and class presentations. Examines the social implications of learning and speaking these languages. Students must obtain learning materials for their language of study. Course is repeatable to a maximum of 10 units.

ETST 163 (E-Z) Special Topics in Gender, Sexuality, and Race 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Selected topics addressing the issues of gender, sexuality, and race.

ETST 163E Introduction to Queer Studies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the intersections between the social construction of sexuality and the political economy of capitalism. Focuses on the United States. Includes the legacies of queer social movement and coalition building as well as the role of the contemporary United States where capital circulates and sexual identities are produced, contested, and negotiated.

ETST 164 History of African American Education: 1950-Present 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ETST 147. Introduces the major themes in African American education. Focuses on litigation in public education, politics, policies in circumventing desegregation, and churches and community organizations advancing desegregated education. Also explores poverty and urban schools, social programs, the Afrocentric pedagogy of failure, separate schools for blacks, resegregation, and the achievement promise.

ETST 165 Latinos, Asylum, and Migrant Detention 4 Seminar, 3 hours; clinic, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Seminar to study the politics of asylum and migrant detention practices in the United States in a global perspective. Students will gain knowledge on asylum and detention regime through both the lens of global political economy, critical race theory, and through practical engagement with refugee and migrant organizations/legal practitioners.

ETST 167 Psychological Development of Black Youth in Context 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 002. Covers theoretical and scientific approaches to the study of Black youth's development (birth to late adolescence) from a strengths-based perspective. Considers social contexts including family, peers, schools, neighborhoods, media, and other institutions that inform Black youth's development. Covers research and theory from psychology, education, sociology, legal studies, and ethnic studies. Cross-listed with PSYC 167.

ETST 168 Psychological Aspects of the Black Experience 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 002. Examines psychological explanations, theoretical models, and empirical research to promote an understanding of how personal characteristics, culture, and social conditions inform the Black American experience. Explores structural factors, group membership, lifestyles, ethno-historical factors, and wider societal influences to understand the uniqueness of the Black experience. Cross-listed with PSYC 168.

ETST 170 Third World Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Analysis of some major works associated with Third World literature and film. Emphasis on African, Latin American, Caribbean, African American, and Chicano Literature.

ETST 172 Music Cultures of Southeast Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in the Philippines, Indonesia, Malaysia, Thailand, Myanmar (Burma), Laos, Cambodia, and Vietnam. Designed for the student interested in the performing arts and cultures of mainland and insular Southeast Asia. No Western music background is required. Cross-listed with ANTH 176, AST 127, DNCE 127, MUS 127, and SEAS 127.

ETST 174 Race, Law, and Education in the United States 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the role legal decisions, judicial policymaking, and race play in education. Studies the impact on schools, their communities, students, teachers, administrators, and disenfranchised groups.

ETST 175 Gender, Ethnicity, and Borders 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 001 or ETST 001H or GSST 010 or GSST 010S or upper-division standing. Examines literary, theatrical, and visual sites where the "in-between" space of border cultures is mapped. Materials include autobiographies, testimonial literature, films, novels, performance scripts, and art. Focuses on the interplay of gender and ethnicity. Cross-listed with GSST 175.

ETST 177 The United States Prison Industrial Complex: Race, Gender, and Citizenship 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 001 or ETST 001H or ETST 002 or ETST 002H or ETST 003 or ETST 005 or ETST 005H or ETST 007 or ETST 007H or ETST 004 or HIST 004 or ETST 008 or ETST 012 or ETST 012H or RLST 012 or RLST 012H or ETST 014 or ETST 011 or ETST 098; or consent of instructor. Examines the racialized and gendered information of U.S. jurisprudence, policing, and punishment practices. Explores the connections between prison expansion, corporate investment in prison and policing technology, exploitation of prison labor, and deployment of prison-building initiatives as pork barrels for elected officials. Also analyzes anti-prison, prison reform, and penal abolitionist discourses.

ETST 178 Disability and Race 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores intersections of disability and race in law and policy, critical theory, and media and culture. Themes include how disability discrimination intersects with racial discrimination, how disability and racial justice movements inform each other, and how cultural production emerges from the intersections of race and disability.

ETST 179 Race and Environment: Nature, Colonialism, and Justice 4 Seminar, 3 hours; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Explores the interdependent relationships between race and environment through law, policy, culture, geography, (settler) colonialism, and (racial) capitalism, focused on the United States. Topics include environmental and climate justice, decolonial and abolitionist thought, urban political ecology, and the social constructions of human, nonhuman, and "nature."

ETST 180 California Indian History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Provides students with a broad understanding of the rich and varied heritage and history of California Indians from the invasion of the Spanish to the twentieth century. Examines geographically and culturally diverse groups as a means of illustrating the various Euro-American Indian policies that affected native Californians. Course is comparative and thematic. Cross-listed with HISA 140.

ETST 181 Southwestern Indian History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Presents a historical examination of selected Native American groups in the Southwest. Examines the relationship of Southwestern Indians to the Spanish, Mexican, and United States governments. Focuses on Quechans, Tohono O'Odom, Yavapai, Chiracahuas, Navajos, Zunis, Hopis, Comanches, and selected Pueblos along the Rio Grande. Cross-listed with HISA 141.

ETST 182 Northwestern Indian History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines selected aspects of Northwestern Indian History, from approximately the 1750s to the twentieth century. Deals with several native groups along the Northwest coast from Alaska to Oregon. Compares policies of the Russian, Spanish, English, and United States governments. Particular emphasis on the 1850s when the U.S. negotiated a number of treaties with Native Americans in the Washington and Oregon territories. Cross-listed with HISA 142.

ETST 184 American Indian Policy in the Twentieth-Century 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. This course will begin with the end of the treaty-making period and the point in time that the United States emerged as a colonial power (1871). The history of the relationship between the United States government and the American Indian tribes from the year 1871 to 1988 will be presented phase by phase. In addition, it will explore the position and role of the American Indian during the last twenty years.

ETST 185 Native American Law 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Emphasis on traditional law, civil and criminal rights, water rights, First Amendment religious freedom, and gaming on reservations.

ETST 186 Policing and the Hegemony of "Law and Order": Race, Gender, Sexuality, Citizenship, and the Politics 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): ETST 001 or ETST 001H or ETST 002 or ETST 002H or ETST 003 or ETST 004 or HIST 004 or ETST 005 or ETST 005H or ETST 007 or ETST 007H or ETST 008 or ETST 012 or ETST 012H or RLST 012 or RLST 012H or ETST 014 or ETST 011 or ETST 098; or consent of instructor. Provides a critical approach to the interdisciplinary study of state violence and militarized policing. Examines ways in which policing technologies and tactics are organized through racialized, gendered, and classed hierarchies.

ETST 187 Anticolonialist Thought 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the political-intellectual work of anticolonialist struggle and independence movements.

ETST 188 Native American Women 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Native American gender systems and the changing roles of women. Examines the cultural productions of indigenous women that make important interventions in our understanding of gender and social justice in contemporary Native America. Materials include testimonial literature, autobiographies, films, novels, and popular culture.

ETST 189 Popular Culture and the Production of Race 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): ETST 001 or ETST 001H, ETST 100; or consent of instructor. Offers an interdisciplinary and theoretical approach to the study of various popular film and television genres in relation to the production--and contestation--of racial meaning. Concerned with the material significance of film and television as, simultaneously, "entertainment," "pleasure," "mass culture," "(self-)representation," and "cultural resistance or insurgency."

ETST 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): upper-division standing and consent of instructor. Independent study and research by qualified undergraduate students under the supervision of a particular faculty member. Course is repeatable to a maximum of 16 units.

ETST 191 (E-Z) Seminar in Ethnic Studies 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): for ETST 191E, ETST 191G, and ETST 191R, and ETST 191S: upper-division standing or consent of instructor; for ETST 191F: ETST 001 or ETST 001H, ETST 005 or ETST 005H; for ETST 191N: ETST 002 or ETST 002H or ETST 008. Selected topics in the ethnohistories and cultures of African American, Asian American, Chicano/Latino, and Native American ethnic groups. E. Native American History And Research; F. Asian American Studies; G. Chicano Psychology; N. Chicano Literature: A Comparative Approach; R. Research Methodology.

ETST 198 R'course: Variable Topics 1 Activity, 3 hours. Prerequisite(s): permission needed from department. An opportunity for UCR undergraduate students to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original course topics are variable and unique from other departmental course offerings, designed to highlight the student facilitators' expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 8 units.

ETST 198G Group Internship 1 to 12 Internship, 2 to 24 hours; research, 1 to 12 hours. Prerequisite(s): upper-division standing; consent of instructor. On- or off-campus internship related to the interests of core ethnic-group students under the joint direction of an on- or off-campus supervisor and an Ethnic Studies faculty member. Course is repeatable to a maximum of 16 units.

ETST 198I Individual Internship 1 to 12 Internship, 2 to 24 hours; research, 1 to 12 hours. Prerequisite(s): upper-division standing; consent of instructor. On- or off-campus internship related to the ethnic community, conducted under the joint direction of an on- or off-campus supervisor and an Ethnic Studies faculty member. Requires a report based on the experience. Course is repeatable to a maximum of 16 units.

Graduate Courses

ETST 200 History of Ideas in Ethnic Studies 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the foundational ideas critical for understanding the historical evolution of race and ethnic issues in the United States and within international relations. Prepares graduate students to conceptualize multidisciplinary and comparative ethnic studies research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 201 Sociocultural Theories in Ethnic Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Examines theoretical approaches to the study of race and ethnicity in the United States. Assesses the relative strengths and weaknesses of key theoretical paradigms. Perspectives may include symbolic interaction, phenomenology, class analysis, sovereignty, literary criticism, feminism, psychoanalysis, racial formation, critical race theory, postmodernism, and global or transnational. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 203 Research Methods in Ethnic Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Examines some of the foundational theories and methods employed in the field of ethnic studies. Provides basic knowledge in designing and implementing a research project utilizing multiple methods. Course is repeatable as content changes to a maximum of 12 units.

ETST 204 Critical Race Perspectives in Latino Education 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Examines the social, economic, and political factors that impact contemporary Latino/a education. Explores alternative epistemologies that challenge traditional modes of schooling as well as alternative pedagogies - both in and outside public school classrooms - that are rooted in community-based knowledge.

ETST 205 Feminism, Race, and the Politics of Knowledge 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores how race and gender are produced and institutionalized in U.S. social arrangements, emphasizing the social construction of race and gender in science, culture, and the law. Surveys a collection of nineteenth- and twentieth-century scientific and legal texts alongside feminist of color writings that analyze the relationship between knowledge, empowerment, and social justice. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ETST 215 Asylum Policy and Migrant Detention 4 Seminar, 3 hours; clinic, 3 hours; written work, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers the politics of asylum and migrant detention practices in the United States in a global perspective. Includes knowledge on asylum and detention regime through both the lens of global political economy, critical race theory, and through practical engagement with refugee and migrant organizations/legal practitioners. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ETST 221 Race, Gender, Law, and Equal Protection 4 Seminar, 3 hours; field, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Examines the interrelationships among law, race, gender, equal protection doctrine, and the state. Addresses contemporary theoretical challenges to concepts such as critical legal studies, critical race theory, "LatCrit," and feminist jurisprudence. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes to a maximum of 12 units.

ETST 222 Intersectionalities 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines theory of intersectionality in transnational framework and historical perspective. Addresses problematics of social identity construction and the body. Considers analyses in relation to people of color and issues of race, sex, economic oppression, homophobia, transgender possibilities, ageism, militarization, nationalism, and globalization. Focuses on collective strategies of resistance and revolution. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 223 Chicana/O Expressive Culture: Theory and Practice 4 Seminar, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Examines Chicana/o cultural studies theories while tracing the history of diverse communities and expressive cultures from Spanish colonial period through turn of the twenty-first century. Assesses role of popular culture in Mexican American life. Explores the Chicanas/os' impact upon the development of popular culture and academia in American

life. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 224 Race and State Violence 4 Seminar, 3 hours; term paper, 2 hours; written work, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Engages critical social theories of race. Focuses on state-mediated technologies of power and domination. Emphasizes analyses of race, racism, and white supremacy that conceptualize their historical constitution of statecraft and nation-building processes. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content or topic changes to a maximum of 12 units.

ETST 225 Imperialism, Colonialism, and Racism: Global Historical Perspectives 4 Seminar, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Charts a critical interdisciplinary genealogy of imperialism, colonialism, and racism within the global context of capitalist modernity. Explores the characteristics of imperialism, colonialism, and racism, as well as their relation to each other and to nationalism, decolonization, and globalization. Addresses how these complex articulations have been theorized. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 226 Cultural Politics and Production 4 Seminar, 2 hours; screening, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Considers the discursive and expressive cultural forms produced by racialized subjects. Covers a range of literatures, music, dance, song, and performance forms; the works of individuals and collectives; and social movements. Course is repeatable as content changes to a maximum of 12 units.

ETST 227 Anticolonialism and its Aftermath 4 Seminar, 3 hours; term paper, 1 hour; written work, 2 hours. Prerequisite(s): ETST 201; graduate standing; or consent of instructor. Examines anticolonialist political thought in the context of contemporaneous and subsequent critical work in interdisciplinary fields. Engages these thoughts through frameworks of critical race studies, feminist thought, queer studies, postcolonial studies, and cultural studies. Discusses relevance of anticolonialist theorizations and insights to contemporary social and political problems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 228 Race, Law, and Educational Policy 4 Lecture, 3 hours; term paper, 1.5 hours; extra reading, 1.5 hours. Prerequisite(s): graduate standing or consent of instructor. Explores how law and race shape educational policies, as well as how educational policies and practices shape race and law. Examines how decisions made at the federal, state, and local levels influence public education opportunities and access. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 230 Gramscian Thought & Subaltern Struggles 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers Antonio Gramsci's primary writings as well as select texts by scholars that have applied his theoretical insights to the study of struggles between subaltern groups and states in multiple contexts. Includes the application of Gramscian theory and methods to advanced projects in the social sciences and humanities. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ETST 231 Racial Capitalism and the Black Radical Tradition 4 Seminar, 3 hours; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Examines race as a structural mechanism and ideological terrain that manifests inequalities foundational to capitalism. Explores radical traditions of resistance, revolt, abolition, and survival that have emerged from (Queer) Black, Indigenous, and People of Color communities. Emphasizes on the state, political economy, and cultural studies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ETST 232 Race, Environment, Resistance 4 Term paper, 1.5 hours; lecture, 3 hours; extra reading, 1.5 hours. Prerequisite(s): graduate standing; or consent of instructor. Examines the intersections of race and environment particularly within the modern state. Interrogates state-sanctioned racial and environmental violence and the making of premature death and debility. Explores the multiple strains of resistance that emerge including environmental justice, abolition, decolonization, and anti-statism.

ETST 243 (E-Z) Special Topics in Ethnic Studies 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing. A critical analysis of current theory and research in special areas of Ethnic Studies. Covers a single topic not addressed in a regular course. Topics vary from quarter to quarter. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of units.

ETST 243E White Reconstruction 4 Lecture, 3 hours; activity, 3 hours; weekly writing assignments, 2 hours; biweekly presentations; 3 hours. Prerequisite(s): graduate standing and consent of instructor. Examines the political agendas, socio-historical assumptions, and mundane structures of racial violence that constitute the announcement and canonization of a post-civil rights period occurring after the 1960s. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topic changes to a maximum of 12 units.

ETST 243F Race, Utopia, the Human in Sci-Fi 4 Lecture, 3 hours; activity, 3 hours; short paper, weekly presentations, final paper, Prerequisite(s): graduate standing; consent of instructor. Explores through an afrofuturist lens how the concepts of utopia and of human life (collective and individual) have been imagined and practiced in science fiction literature and music. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topic changes to a maximum of 12 units.

ETST 243G Racial and Racial-Colonial Genocide 4 Lecture, 3 hours; activity, 3 hours; weekly writing assignments, 2 hours; biweekly presentations, 3 hours; final paper. Prerequisite(s): graduate standing; consent of instructor. Attempts to generate a radical conceptualization and theorization of racial genocide as a historically continuous, distended apparatus of social determination and systemic violence. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topic changes to a maximum of 12 units.

ETST 244 Borders, Borderlands, and Chicana/O Studies 4 Seminar, 3 hours; research, 3 hours; extra reading, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Examines the borderlands as a site of social and political negotiation over space and within cultural studies. Topics include race, gender, activism, and culture. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D. Course is repeatable as content changes to a maximum of 12 units.

ETST 245 Theories in Chicana/O Studies 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to the historical development of theoretical paradigms and models in Chicana/o studies. Covers 1960s protest literature, critical race theory, Chicana feminist theory, "LatCrit," and cultural citizenship. Addresses critical evaluation and application of these paradigms in order to understand the experiences of Chicanas/os and other subordinated communities. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 246 Chicano Historiography: Identity, Politics, and the Writing of Chicana/O History 4 Seminar, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Surveys approaches and genres in the field of Chicano history from classic works to cutting-edge topics. Analyzes methods employed as well as theoretical underpinnings. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 247 Policy and Politics: Grass Roots Versus Coercive State 4 Seminar, 3 hours; discussion, 1 hour, written work, 2 hours.

Prerequisite(s): graduate standing; consent of instructor. Provides a current examination of the status of Chicana(o)/Latina(o) politics from both a grass roots and coercive state perspective. Examines divergent theoretical approaches within the contexts of liberal capitalism, pluralist versus elite theory, and identity politics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 248 Race and Critical Educational Policy 4 Seminar, 3 hours; written work, 1 hour; extra reading, 2 hours; Prerequisite(s): graduate standing; consent of instructor. Examines a set of diverse, discipline-based conceptual perspectives and analytic frameworks used to interpret policy purposes, processes, contents, and outcomes. Focuses on the political dimensions of education policy issues. Also explores the conceptual frameworks and skills required in studying politics and exercising leadership in organizational settings. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 249 Race and Critical Educational Politics 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the political dimensions of education policy issues, processes, and choices pertaining to governmental arrangements, community contexts, and interest group pressure. Provides conceptual frameworks and perspectives that examine political decision making. Utilizes case studies of educational policy making in educational institutions at the local and state levels. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 254 Asian American Cultural Critique and Theory 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines major critical developments, interventions, and issues in Asian American cultural critique and theory. Charts the historical development of the field of Asian American literary and cultural studies. Interrogates the contexts and constraints of the field's institutional formation and recognition. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

ETST 255 Critical Issues in Asian American Studies 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Examines and seeks to develop a critical appreciation of research literature on Asians in America and to develop alternative interpretations of the Asian American experience. Topics include Asian American historic, economic, political, social, and psychological issues. Course is repeatable as content changes to a maximum of 12 units.

ETST 256 Critical Issues in Asian Pacific American Communities 4 Seminar, 3 hours; practicum, 3 hours. Prerequisite(s): graduate standing. Examines contemporary issues facing Asian Pacific American communities. Students engage in active research in these communities.

ETST 289 Colloquium in Ethnic Studies 1 Colloquium, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Lectures and discussions by students, faculty, and invited scholars on selected topics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

ETST 290 Directed Studies 1 to 6 Scheduled research, 3-18 hours. Prerequisite(s): graduate status and consent of instructor. Research and special studies in Ethnic Studies. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ETST 291 Individual Study in Coordinated Areas 1 to 12 Individual Study, 3 to 36 hours. Prerequisite(s): graduate standing; consent of instructor. A program of study designed to advise and assist candidates who are preparing for doctoral examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ETST 292 Concurrent Analytical Studies in Ethnic Studies 1 to 4 Individual Study, 3 to 12 hours. Prerequisite(s): consent of instructor. Taken concurrently with a 100-series course in Ethnic Studies, but on an individual basis. Devoted to completion of a graduate-level paper based on research or criticism related to the 100-series course. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ETST 293 Research Topics in Ethnic Studies 2 Seminar, 3 hours. Prerequisite(s): graduate standing; consent of instructor. A series of seminars by guests, faculty, and advanced graduate students that addresses research topics in ethnic studies. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

ETST 297 Directed Research 1 to 2 Research, 3 to 6 hours. Prerequisite(s): graduate standing; consent of instructor. Individualized research in topics outside the dissertation area. Conducted under the sponsorship of specific faculty members. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ETST 299 Research For the Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): satisfactory completion of the Ph.D. qualifying examination. Faculty-directed research for preparation of the dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

ETST 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 hours. Prerequisite(s): limited to teaching assistants; graduate standing. Supervised teaching in lower- and upper-division courses. Required of all Ethnic Studies teaching assistants. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ETST 405 Proseminar On Professionalization 2 Seminar, 27 hours per quarter; practicum, 3 hours per quarter. Prerequisite(s): graduate standing; consent of instructor. Covers a broad range of topics related to academic professionalization. Addresses issues pertaining to the dissertation, publishing, professional activity, and the process of getting tenure. Also covers issues related to teaching at the university level. Graded Satisfactory (S) or No Credit (NC).

Evolution, Ecology, and Organismal Biology

See Biology (Graduate Program)



Gender and Sexuality Studies

(Formerly Women's Studies)

Subject abbreviation: GSST
College of Humanities, Arts, and Social Sciences

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Majors

The Department of Gender and Sexuality Studies offers the B.A. in Gender and Sexuality Studies and the B.S. in Sustainability Studies.

Minors

The Department of Gender and Sexuality Studies offers two minors: a minor in Feminist Studies that emphasizes feminist history, theory, and practice, and a minor in Queer Studies (formerly Lesbian, Gay, Bisexual, Intersex, and Transgender Studies) that emphasizes queer history, theory, and practice.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Gender and Sexuality Studies Major

The major in Gender and Sexuality Studies is committed to providing undergraduate students with intersectional feminist perspectives on gender and sexuality and to fostering critical feminist and queer research. The major integrates interdisciplinary and transnational approaches to the theorizing and study of gender and sexuality. The major offers a range of courses that facilitate student learning about the diversity of genders and sexualities in the United States and globally.

Majors learn about the history and contemporary structures of cisheteropatriarchy and white supremacy and engage with strategies for resistance. Students completing the major are exposed to a wide range of feminist theories and epistemologies through required core courses and electives. This major educates students to be global citizens who are prepared for future feminist and queer activism, for graduate-level study in gender and sexuality studies, and/or for careers in education, law, non-profit work, public policy, social justice, social work, health care, and related fields. This major also encourages students to participate in internships with local feminist and queer social justice organizations and/or to enrich and enhance their undergraduate experience and learning through study abroad.

The major requirements for the B.A. degree in Gender and Sexuality Studies are as follows:

Major Requirements

1. Lower-division requirements (three courses [at least 12 units])
   a) GSST 001 or GSST 001H or GSST 001S
   b) One of the following: GSST 010, GSST 020, GSST 020H, GSST 020S, GSST 030 or GSST 030H
   c) One additional lower-division GSST course
2. Upper-division requirements (ten courses [at least 40 units])
   a) GSST 100
   b) GSST 191A and GSST 191B
   c) Seven courses of electives chosen from the list below with the following distribution requirements:
      (1) One course focusing on African American women, Asian American women, Chicanas/Latinas, or Native American women in the United States or on women from societies in Latin America, Asia, the Middle East, or Africa
      (2) One course focusing on issues of sexuality, sexual orientation, sexual identification, or masculinity and femininity
      (3) The following courses may only be counted one time towards the major: GSST 190, GSST 195, GSST 198G

Elective Course Work

Upper-division Gender and Sexuality Studies courses or courses in another department that are cross-listed with Gender and Sexuality Studies.

Closely related upper-division courses from other programs or departments may be substituted upon approval.

Sustainability Studies Major

The Sustainability Studies Bachelor of Science degree offered by the Gender and Sexuality Studies Department offers a comparative, interdisciplinary, transnational approach to the theories and practices of building a sustainable future. Major coursework focuses on a range of social and scientific challenges to sustainability including: climate change, air and water pollution, toxic contamination, energy demands, economic growth, agricultural production, and environmental injustices associated with differences in advantages due to race and ethnicity, socio-economic class, gender, sexuality, religion and ability. Courses in gender and sustainability, cultural studies, policy, media, and social sciences, natural and earth sciences, engineering, and health and medicine prepare students to respond to challenges to local, regional, and global sustainability. Students will be trained in feminist paradigms and methodologies associated with intersectionality, dialogue, and relation. Through in-depth, engaged learning experiences, this major educates global citizens who will be prepared for careers in industry, health care, public service, policy advocacy, education, and social activism relevant to sustainability.

Majors are strongly encouraged to complete internships with local environmental organizations, health advocates, and other institutions as well as to broaden their perspectives through the study abroad program. This major may accommodate CNAS transfers who have considerable amounts of training in science, yet desire an interdisciplinary education in sustainability that recognizes environmental change is gendered.

Major Requirements

1. Lower-Division Requirement (4 courses, 14–16 units)
   a) GSST 001
   b) GSST 021
   c) Two courses from the following list of courses in natural, earth, and environmental sciences. (Cannot double count with the CHASS math and science 20 unit requirement): BIOL 003, BIOL 005C, BIOL 040, BPSC 011,BPSC 021, ENTM 010, ENTM 020, ENTM 050/BPSC 050, GEO 002, GEO 004, GEO 009, GEO 010, GEO 011, GEO 012, CEE 010 (2 units), ENGR 096/NASC 096/HASS 096, ENSC 001, ENSC 002, ENSC 006/ECON 006, ME 004, PHYS 007, PHYS 010, PHYS 016, PHYS 024, PHYS 037
2. Quantitative Method Requirement (one course, 4 units)
   One of the following courses or sequences OR an additional science course with a lab: SOC 001/SOC 004/SOC 005, STAT 008, STAT 100A, PSYC 011, POSC 114, ECON 101, GEO 157
3. Upper-Division Requirements (9 courses, 36 units)
   a) GSST 100
   b) Two GSST courses, of which at least one is from the following courses on gender & sustainability: GSST 131, GSST 161, GSST 171/SEHE 105, GSST 173/SEHE 141, GSST 181, GSST 183
   c) Four courses from any of the following lists.(Students may concentrate in one or two areas or take courses from all areas. Up to two courses for this requirement may be replaced by any of the following CNAS courses. Students are responsible for fulfilling the relevant prerequisites: BIOL 100/ENTM 100, BIOL 165/BPSC 165, ECON 143A/ENSC 143A, ENSC 101, ENSC 102, ENSC 141, ENTM 124, ENTM 125, ENTM 126, GEO 160, GEO 161, GEO 167, GEO 169.)
      (1) Environmental policy and politics: PBPL 129, POSC 106/SEHE 136, POSC 127/SEHE 127, POSC 137/SEHE 137, POSC 139/SEHE 139, POSC 160, POSC 180, POSC 189

(2) Health & medicine: ANTH 144E, ANTH 144F/GSST 185, ANTH 144J, ANTH 144M, ANTH 144N, ETST 116, HIST 107

(3) Science, technology, and related topics: ANTH 110, ANTH 132, ANTH 140T, AST 107, ETST 183, HIST 105, HIST 106, HIST 109/ENGR 109, MCS 122, PHIL 117, RLST 164, SOC 137, SOC 161, SOC 184

(4) Internship or Honors Thesis focusing on sustainability: GSST 195, GSST 198-I

d) Capstone course sequence, required for all seniors: GSST 191A + GSST 191C

Minor

Feminist Studies

The minor in Feminist Studies exposes students to critical feminist and intersectional theory and research. The minor welcomes students engaged in crossdisciplinary learning and offers an outstanding opportunity for students in other majors to develop expertise in the field of feminist studies. Minors are encouraged to participate fully in the activities and offerings in the Department of Gender & Sexuality Studies, including the department's internship program and study abroad.

The minor in Feminist Studies consists of six courses (at least 24 units) distributed as follows:

1. Lower-division requirements (two courses [at least 8 units])
   a) GSST 001 or GSST 001H or GSST 001S
   b) One GSST lower-division course
2. Upper-division requirements (four courses [at least 16 units])
   a) GSST 100
   b) Three upper-division GSST courses.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Queer Studies (formerly LGBIT Studies)

The minor in Queer Studies reflects current critical, theoretical, and methodological developments across several disciplines that focus on lesbian, gay, bisexual, intersex, and transgender issues. The field of queer studies is by nature interdisciplinary, and this minor is meant to encourage new crossdisciplinary research in the field for interested students in the College of Humanities, Arts, and Social Sciences. The curriculum addresses such issues as sexual identity and orientation; queer and trans representation; queer and trans perspectives on the arts; retheorizations of gender; sexuality and cultural diversity; intersections of sexualities and ethnic identities.

Queer Studies Minor

Subject abbreviation: LGBS
College of Humanities, Arts, and Social Sciences

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Department Office, INTN 2017
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gsst.ucr.edu/queer-studies-minor

Established in 1996, UCR's queer studies minor was the first of its kind in the University of California system. The minor reflects current critical, theoretical, and methodological innovations in the study of gender and sexuality and the representation of queerness in art, literature, and media. Queer studies is by nature an interdisciplinary field, and this program is meant to introduce students to new developments in queer studies across multiple disciplines in the College of Humanities, Arts, and Social Sciences. Though the minor is housed in the Department of Gender and Sexuality Studies, over 20 UCR faculty members are affiliated with queer studies and teach the minor's required courses. The curriculum addresses: queer political movements, queer history, the evolution of sexual and gender identities, queer representation, queer perspectives on the arts, queer intersectionalities, and queer theory.

Requirements for the minor (24 units)

1. Lower-division requirements (4 units) chosen from LGBS 001 or GSST 001
2. Upper-division requirements (5 courses [at least 20 units]) chosen from the approved list of courses:
   a) Humanities: at least one of the five from ENGL 122 (E-Z)/LGBS 122 (E-Z), ENGL 143 (E-Z)/LGBS 143 (E-Z)/MCS 143 (E-Z), LGBS 105, GSST 139/LGBS 139
   b) Fine Arts: at least one of the five from DNCE 135, ENGL 143 (E-Z)/LGBS 143 (E-Z)/MCS 143 (E-Z), LGBS 153/MUS 153
   c) Social Sciences: at least one of the five from ANTH 145/GSST 103, ETST 175/GSST 175, GSST 128/LGBS 128, GSST 134/LGBS 134, GSST 135/LGBS 135, GSST 137/LGBS 137, GSST 139/LGBS 139, GSST 152/LGBS 152, GSST 100

Students may petition to have a course not on the approved list counted towards the five upper division requirements provided they can demonstrate that LGBIT issues play a significant role in the course and that they will focus their own work for the course (amounting to 30% of the final grade) on an LGBIT topic.

Students may use 4 units of LGBS 190 and up to 8 units of LGBS 193 to count towards the five upper division requirements.

Note

Students may satisfy an upper-division requirement by completing 4 units of LGBS 198-I (Internship).

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for information on minors.

Upper-Division Courses

LGBS 112 History of Queer Cinema 4 Lecture, 3 hours; screening, 3 hours; activity 2 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the aesthetic hallmarks, political impulses, and theoretical responses that distinguish queer cinema as a unique, important tradition within film history. Provides a historical overview of global, independent, Hollywood, and alternative queer production from the 1900s to the present. Cross-listed with MCS 112, and GSST 112.

LGBS 122 Queer Texts and Bodies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A study of topics on gender, sexuality and sexual identity. Covers issues such as gay and lesbian texts and contexts; sexual ideologies and literature; marginalized writers and texts; and the uses of theories of sexualities in the study of literature. Course is repeatable as content or topic changes to maximum of 12 units. Cross-listed with ENGL 122.

LGBS 128 Critical Approaches to Heterosexuality 4 Lecture, 3 hours; extra reading, 2 hours; written work, 3 hours. Prerequisite(s): one of the following courses: GSST 001, GSST 001H, GSST 001S, LGBS 001. Examines the late nineteenth-century origins and twentieth-century evolution of the meaning of heterosexuality in the United States. Includes the medical, psychological, and political history of heterosexuality; the race and gender components of heterosexuality; and the intersections of heterosexuality and queerness. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with GSST 128.

LGBS 134 Queer Identities and Movements in the United States 4 Lecture, 3 hours; extra reading, 1 hour; individual study, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines important twentieth- and twenty-first century developments in queer culture and activism in the United States. Focuses on the origins of sexual identity; the relationship between sexuality, race, and gender; queer representation in art and media; and central issues in queer theory. Cross-listed with GSST 134.

LGBS 135 Love, Desire, and Lesbian Sexuality 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Expands upon the notion of lesbian identification and sexuality. Emphasizes the influence of feminism on the interdisciplinarity of lesbian studies and the complexity of lesbianism across class, race, ethnic, age, and national and international differences. Cross-listed with GSST 135.

LGBS 137 Critical Queer Politics 4 Lecture, 3 hours; individual study, 2 hours, written work, 1 hour. Prerequisite(s): one of the following courses: GSST 001, GSST 001H, GSST 001S; or

consent of instructor. Presents Euro-American configurations of modern sexuality to map queer communities and homosexual presence across time and space. Critically explores the invisibilities, injustices, erasures, distortions, silences, and voices produced as a result of queer mobility, global gay, and global queer liberation. Cross-listed with GSST 137.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Lower-Division Courses

GSST 001 Gender and Sexuality 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): none. An introduction to theories of sex and gender differences, the origins of patriarchy, and variations in sexual behavior and sexual norms. Credit is awarded for one of the following GSST 001, GSST 001H, or GSST 001S.

GSST 001H Honors Gender and Sexuality 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to GSST 001 and GSST 001S. An introduction to theories of sex and gender differences, the origins of patriarchy, and variations in sexual behavior and sexual norms. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of GSST 001 or GSST 001H or GSST 001S.

GSST 001S Gender and Sexuality 5 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): none. An introduction to theories of sex and gender differences, the origins of patriarchy, and variations in sexual behavior and sexual norms. Credit is awarded for one of the following GSST 001S, GSST 001, or GSST 001H.

GSST 002 Introduction to Lesbian, Gay, Bisexual, and Transgender Studies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Introduces basic issues in lesbian, gay, bisexual, and transgender studies. Topics include the history of sexuality, identity politics and community activism, the relation between sexuality and gender, the theories of sexual identity, and the globalization of lesbian, gay, bisexual, intersexual, and transgender issues.

GSST 010 Women and Culture 5 Lecture, 3 hours; written work, 3 hours; individual study, 1 hour; research, 2 hours. Prerequisite(s): none. Topics include the roles of women in cultural creation and production; the relation of women artists to the societies of their time; and the images of women in the art and literature of the modern world. Themes and periods covered vary. Credit is awarded for one of the following GSST 010 or GSST 010S.

GSST 010S Women and Culture 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours; individual study, 1 hour; research, 2 hours. Topics include the roles of women in cultural creation and production; the relation of women artists to the societies of their time; and the images of women in the art and literature of the modern world. Themes and periods covered vary. Credit is awarded for one of the following GSST 010S or GSST 010.

GSST 011 Media Imagery of Women and Class 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines how mass media portray class as a gendered category. Utilizes a comparative and historical approach, integrating social sciences and humanities to analyze images of women portrayed as poor, working class, middle class, or wealthy.

GSST 012 Islam and Feminism 4 Lecture, 3 hours; discussion, 1 hour; written work, 1 hour; term paper, 1 hour. Prerequisite(s): none. Focuses on the intersections between Islam and feminism. Topics include feminist interpretations of the Qur'an, Muslim women's movements and activisms in Islamic and non-Islamic societies, and the complex interactions between the nation-state, religion, gender, and sexuality. Cross-listed with MEIS 012, and RLST 011. Credit is awarded for one of the following RLST 011, GSST 012, MEIS 012, GSST 012H, MEIS 012H, or RLST 011H.

GSST 012H Honors Islam and Feminism 4 Lecture, 3 hours; discussion, 1 hour. Honors course corresponding to GSST 012. Focuses on the intersections between Islam and feminism. Topics include feminist interpretations of the Qur'an, Muslim women's movements and activisms in Islamic and non-Islamic societies, and the complex interactions between the nation-state, religion, gender, and sexuality. Cross-listed with MEIS 012H, and RLST 011H. Credit is awarded for one of the following RLST 011H, GSST 012H, MEIS 012H, GSST 012, MEIS 012, or RLST 011.

GSST 013 Gender and Disability 4 Lecture, 3 hours; written work, 1 hour; extra reading, 2 hours. Examines gender and disability from a feminist perspective. Explores how gender and disability shape all aspects of social life including institutions, identities, bodies, and discourses. Introduces feminist and queer theories of disability. Engages with societal responses to disability such as eugenics, exclusion, and institutionalization. Considers possibilities for feminist disability justice. Credit is awarded for one of the following GSST 013 or GSST 013S.

GSST 013S Gender and Disability 5 Lecture, 3 hours; discussion, 1 hour; written work, 1 hour; extra reading, 2 hours. Examines gender and disability from a feminist perspective. Explores how gender and disability shape all aspects of social life including institutions, identities, bodies, and discourses. Introduces feminist and queer theories of disability. Engages with societal responses to disability such as eugenics, exclusion, and institutionalization. Considers possibilities for feminist disability justice. Credit is awarded for one of the following GSST 013S or GSST 013.

GSST 016 Sexuality and Religion in Global Perspective 4 Lecture, 3 hours; discussion, 1 hour. Introduces sexuality studies within the comparative study of religion, rooted in the theoretical frameworks of gender and sexuality studies. Explores the central themes of transnationalism and global dynamics of power. Focuses on critical heterosexuality studies with some LGBT studies and an underlying queer studies perspective. Cross-listed with RLST 016. Credit is awarded for one of the following RLST 016, GSST 016, GSST 016H, or RLST 016H.

GSST 016H Honors Sexuality and Religion in Global Perspective 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors; or consent of instructor. Honors course corresponding to RLST 016. Introduces sexuality studies within the comparative study of religion, rooted in the theoretical frameworks of gender and sexuality studies. Explores the central themes of transnationalism and global dynamics of power. Focuses on critical heterosexuality studies with some LGBT studies and an underlying queer studies perspective. Cross-listed with RLST 016H. Credit is awarded for one of the following RLST 016H, GSST 016H, GSST 016, or RLST 016.

GSST 020 Women, Feminism, and Society in A Global Perspective 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): none. An introduction to the social, political, and legal concerns surrounding women's issues and feminist movements worldwide. Examines topics such as abortion, contraception, and sexual violence within a comparative and international framework. Credit is awarded for one of the following GSST 020, GSST 020H, or GSST 020S.

GSST 020H Honors Women, Feminism, and Society in A Global Perspective 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to GSST 020 and GSST 020S. An introduction to the social, political, and legal concerns surrounding women's issues and feminist movements worldwide. Examines topics such as abortion, contraception, and sexual violence within a comparative and international framework. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of GSST 020, GSST 020H or GSST 020S.

GSST 020S Women, Feminism, and Society in A Global Perspective 5 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): none. An introduction to the social, political, and legal concerns surrounding women's issues and feminist movements worldwide. Examines topics such as abortion, contraception, and sexual violence within a comparative and international framework. Credit is awarded for only one of the following: GSST 020, GSST 020H, GSST 020S.

GSST 021 Gender and Sustainability 5 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours; extra reading, 1 hour; term paper, 2 hours; written work, 1 hour; research, 1 hour. Introduction to the relationship between gender and sustainability in global context. Draws on science, political ecology, and feminism as analytical lenses. Topics may include gender mainstreaming, economic development, ethics, ecology, population management, water treatment, sanitation, air quality, renewable energy, agriculture, political participation, community development, global capitalism, and environmental health.

GSST 022A Introduction to World Literature By Women 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to world literature by women across many centuries. Covers the creative work of women from ancient to early modern periods, examining both texts and the historical circumstances of the earliest women writers. Emphasizes texts originally written in languages other than English from around the globe. Cross-listed with CPLT 022A.

GSST 022B Introduction to World Literature By Women 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to the increasingly powerful voices of women writers in modernity and postmodernity. Emphasizes texts originally written in languages other than English from around the globe. Topics include the question of feminine writing and feminist theories about literature by women. Cross-listed with CPLT 022B.

GSST 030 Violence Against Women 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): none. Addresses structural and interpersonal forms of violence against women and girls. Topics include sexual and physical abuse, rape and sexual assault, battering, body mutilation, forced sterilization or reproduction, sex selection, medical "silences," political torture, and gender-specific socialization for victimization and aggression. Also discusses state and economic policies. Credit is awarded for only one of GSST 030 or GSST 030H or GSST 030S.

GSST 030H Violence Against Women 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to GSST 030. Addresses structural and interpersonal forms of violence against women and girls. Topics include sexual and physical abuse, rape and sexual assault, battering, body mutilation, forced sterilization or reproduction, sex selection, medical "silences," political torture, and gender-specific socialization for victimization and aggression. Also discusses state and economic policies. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of GSST 030 or GSST 030H or GSST 030S.

GSST 030S Violence Against Women 5 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): none. Addresses structural and interpersonal forms of violence against women and girls. Topics include sexual and physical abuse, rape and sexual assault, battering, body mutilation, forced sterilization or reproduction, sex selection, medical "silences," political torture, and gender-specific socialization for victimization and aggression. Also discusses state and economic policies. Credit is awarded for only one of GSST 030 or GSST 030H or GSST 030S.

GSST 031H Latina Women in Literature and Culture 4 Seminar, 3 hours; extra reading, 1 hour; research, 1 hour; term paper, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Analyzes the literatures and cultures of Latin American women and U.S. Latinas. Examines the roles prescribed for women and the relationship of those roles to issues of power and authority. Utilizes texts that acknowledge a tradition of feminine or feminist expression. Satisfactory (S) or No Credit (NC) grading is not available.

GSST 040 Women, Aids, and the Global Economy 4 Lecture, 3 hours; research, 2 hours; individual study, 1 hour. Prerequisite(s): none. Examines the relationship between poverty, inequality, gender, and HIV/AIDS. Analyzes gender and other forms of social inequality that place women at higher risk for the virus. Explores how global structural inequalities impact the lives of women in the global south, as well as considers the conditions of marginal groups in the global north.

GSST 099 Reading and Writing in Gender & Sexuality Studies 4 Seminar, 3 hours; written work, 3 hours; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): GSST 001 or GSST 001S; restricted to major(s) Feminist Studies, Gender and Sexuality Studies, Queer Studies. Develops skills in reading and writing feminist scholarship. Engages with feminist perspectives on reading and writing including autobiomythography and autotheory. Centers deep reading of texts with drafting and revision of written work. Prepares for upper-division work in Gender & Sexuality Studies.

Upper-Division Courses

GSST 100 Gender Theory 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A cross-cultural, multidisciplinary course investigating the development of feminist theory and exploring the construction of gender and sexuality. Emphasizes the "female" and the "feminine" in a variety of cultural contexts. Credit is awarded for one of the following GSST 100 or GSST 100S.

GSST 100S Gender Theory 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): GSST 001 or GSST 001S or GSST 001H; restricted to class level standing of junior, or senior. A cross-cultural, multidisciplinary course investigating the development of feminist theory and exploring the construction of gender and sexuality. Emphasizes the "female" and the "feminine" in a variety of cultural contexts. Credit is awarded for one of the following GSST 100S or GSST 100.

GSST 101 Women, Work, and Capitalism 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): GSST 001 or GSST 001S or GSST 001H or consent of instructor. Examines how class, race, and sexual inequalities impact, contest, and shape gender identities and relations. Analyzes patterns of women's work in the new international division of labor through case studies of export processing zones, reproductive labor, and sex tourism.

GSST 103 Sexualities and Culture 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one of the following courses: GSST 001, GSST 001H, GSST 001S; or consent of instructor. Examines the field of sexuality studies using a comparative, cross-cultural approach. Emphasizes the relation between culture, history, and political economy in the emergence of sexual practices and sexualized identities. Examines theories of sexuality and identity focusing on violence, human rights, and political agency. Cross-listed with ANTH 145.

GSST 104 Witches, Magic, and Religion 4 Lecture, 3 hours; activity 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines magic and witchcraft as distinctive forms of epistemology articulated by women throughout history. Traces the position of religion and science versus these intellectual fields led by women in various settings around the world. Investigates how masculinization of the knowledge production process enabled male dominance.

GSST 105 Women, Race, and Violence: Intersectionalist and Transnational Perspectives 4 Lecture, 3 hours; screening, 8 hours per quarter; extra reading, 2 hours written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduces the theories of violence against women through intersectionalist feminist perspectives. Involves the analysis of violence simultaneously marked by race, ethnicity, nation, class, and sexual orientation. Compares cross-cultural and transnational perspectives.

GSST 107 Feminisms, Race, and Antiracisms: Critical Theories and Intersectional Perspectives 4 Seminar, 3 hours; extra reading, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines how path-breaking scholarship by women of color in the United States and developing countries has been central to rethinking theoretical foundations and developing new ways of knowing, understanding, and practicing politics. Focuses on scholarship that critiques and analyzes issues concerning race, antiracism, human rights, citizenship, empire, globalization, and social justice.

GSST 108 Philosophical Issues of Race and Gender 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Investigates philosophical issues concerning race and gender. Includes the role

of cultural and biological criteria in defining these concepts; roles of race and gender in personal identity; nature of racism, sexism, and their variants; and policy implications such as affirmative action and the civil status of homosexual relationships. Cross-listed with PHIL 108.

GSST 109 Women, Politics, and Social Movements 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): GSST 001 or GSST 001S or GSST 001H or GSST 020 or GSST 020H; or consent of instructor. An overview of women's politics (including participation in social movements) from a global perspective. Considers whether the state can be a site for women's liberation and gender justice.

GSST 110 Gender, Sexuality, and Islam 4 Lecture, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. Focuses on the intersections between gender, sexuality, and religion in Islamicate societies. Discusses the ways in which those formations have been shaped by histories of slavery, imperialism, colonialism, human rights discourses, neoliberalism, contemporary practices of Islamophobia, nationalism, and global LGBTQ activism. Cross-listed with MEIS 110, and RLST 105.

GSST 112 History of Queer Cinema 4 Lecture, 3 hours; screening, 3 hours; activity 2 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the aesthetic hallmarks, political impulses, and theoretical responses that distinguish queer cinema as a unique, important tradition within film history. Provides a historical overview of global, independent, Hollywood, and alternative queer production from the 1900s to the present. Cross-listed with MCS 112, and LGBS 112.

GSST 113 Queer Theory 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): GSST 001 or GSST 001S or GSST 001H or LGBS 001. Examines queer theory's origins and relation to gender and sexuality studies. Critically explores queer of color critique and the intersections of race, class, and gender with sexuality. Looks at other interventions into the field of queer theory and key concepts and current debates.

GSST 114 Queer Texts and Bodies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A study of topics on gender, sexuality, and sexual identity. Covers issues such as gay and lesbian texts and contexts; sexual ideologies and literature; marginalized writers and texts; and the uses of theories of sexualities in the study of literature. Course is repeatable as content or topic changes to a maximum of 12 units. Cross-listed with ENGL 122.

GSST 115 Topics in Queer Art, Culture, Or Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to topics of contemporary importance in the field of Lesbian, Gay, Bisexual, Intersex, and Transgender Studies. Emphasizes different areas of study in the humanities, arts, and social sciences. Course is repeatable as content or topic changes to a maximum of 8 units. Credit is awarded for one of the following GSST 115 or GSST 115W.

GSST 115W Topics in Queer Art, Culture, and Literature 4 Lecture, 3 hours; written work, 1.5 hours; extra reading, 1.5 hours. Prerequisite(s): ENGL 001B with a grade of C or better; or consent of instructor. An introduction to topics of contemporary importance in the field of Lesbian, Gay, Bisexual, Intersex, and Transgender Studies. Emphasizes different areas of study in the humanities, arts and social sciences. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits as alternatives to English 001C. Credit is awarded for one of the following GSST 115W or GSST 115.

GSST 122 Gender in Southeast Asian Diasporic Literature and Film 5 Lecture, 3 hours; screening, 3; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on former Indochinese refugees who are producing literature and films in the United States and France. Examines how the perception of Indochina has been constructed, particularly how the region has been gendered female in the colonial imaginary. Explores the return of Southeast Asian immigrants to the Western gaze. Cross-listed with MCS 142, and SEAS 172.

GSST 123 Transnational Feminist Film and Media 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Covers contemporary women's and feminist film and media productions. Connects the forces of globalization and militarization with gender-related experiences of displacement, migration, immigration, diaspora, trafficking, and refugee status. Focuses on innovative uses of visual language signaling changes in notions of nation, identity, class, race, ethnicity, gender, and sexuality. Cross-listed with CPLT 123.

GSST 124 Asian American Women: Writing the Self in Literature and Film 4 Lecture, 3 hours; screening, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): MCS 010, upper-division standing, or consent of instructor. Analyzes Asian American autobiographies and films written and directed by women. Explores why the genre of autobiography is enabling and contentious within Asian American women's writings. Examines films to see how such women filmmakers contend with memory, gender, and identity. Cross-listed with MCS 123, and SEAS 175.

GSST 125 Gender and Genocide 4 Lecture, 3 hours; individual study, 2 hours; term paper, 1 hour. Prerequisite(s): one of the following courses: GSST 001, GSST 001H, GSST 001S; or consent of instructor. Examines gendered dimensions of contemporary and historical genocides. Analyzes the ways gender ideologies intersect racialization and ethnic marking. Explores how gender shapes selection, forced labor, torture, and murder. Considers gender ideologies in relation to collective, institutional, and individual responses to genocide and genocidal campaigns. Cross-listed with ANTH 106.

GSST 126 Gender, Sexuality, and Music in Cross-Cultural Perspectives 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An overview of gendered performance genres from a number of cultures. Explores gender-specific music and notions of gender that are often constructed, maintained, transmitted, and transformed through music and performance. Cross-listed with ANTH 177, and MUS 126.

GSST 127 Dance, Gender, Sexuality 4 Lecture, 3 hours; research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Explores some of the ways that studying dance (an art form whose medium is the body) illuminates feminist, gender, and sexuality studies --- and vice versa. No previous dance experience required. Cross-listed with DNCE 131.

GSST 128 Critical Approaches to Heterosexuality 4 Lecture, 3 hours; extra reading, 2 hours; written work, 3 hours. Prerequisite(s): one of the following courses: GSST 001, GSST 001H, GSST 001S, LGBS 001. Examines the late nineteenth-century origins and twentieth-century evolution of the meaning of heterosexuality in the United States. Includes the medical, psychological, and political history of heterosexuality; the race and gender components of heterosexuality; and the intersections of heterosexuality and queerness. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with LGBS 128.

GSST 129 Feminist Critiques of Militarization 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): GSST 001, GSST 100 or GSST 100S or GSST 030 or GSST 105 or GSST 107 or GSST 109 or GSST 136 or GSST 150 or GSST 175. Examines the relationship between US militarization and imperialism in the modern era. Applies intersectional analysis to interrogate how militarized sexual violence is shaped by racialized and gendered dynamics between the United States and occupied territories. Engages interdisciplinary scholarship and debates in gender and sexuality studies, ethnic studies, and security studies.

GSST 130 The Body in Western Art: Antiquity to Present 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; Restricted to major(s) Anthropology, Art History, Art History/Admin Studies, Art History/Religious Studies, Gender and Sexuality Studies, History, History/Administrative Studies, History/Law and Society; or consent of instructor. Presents further questions and study of the human body and how it was depicted and interpreted in works of art from

Roman Antiquity to the present. Explores a broad range of artworks in their specific historical, cultural, medical, social, religious, political, and intellectual contexts. Cross-listed with ANTH 161, GSST 130, and HISE 149. Credit is awarded for one of the following AHS 133, ANTH 161, GSST 130, HISE 149, or AHS 016.

GSST 131 Sustainability, Gender and Development in the Global South 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S; GSST 020 or GSST 020H or GSST 020S or GSST 021. Investigates the intersection of sustainable practices, development pressures, and gender in the Global South. Explores nonwestern concepts of sex/gender and nature as epistemological resources in addressing the impact of climate change on livelihoods and social organization. Asks how sustainability theory and practice can be transnational and socially inclusive.

GSST 134 Queer Identities and Movements in the United States 4 Lecture, 3 hours; extra reading, 1 hour; individual study, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines important twentieth- and twenty-first century developments in queer culture and activism in the United States. Focuses on the origins of sexual identity; the relationship between sexuality, race, and gender; queer representation in art and media; and central issues in queer theory. Cross-listed with LGBS 134.

GSST 135 Love, Desire, and Lesbian Sexuality 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Expands upon the notion of lesbian identification and sexuality. Emphasizes the influence of feminism on the interdisciplinarity of lesbian studies and the complexity of lesbianism across class, race, ethnic, age, and national and international differences. Cross-listed with LGBS 135.

GSST 136 Women and Grassroots Organizing 4 Seminar, 3 hours; extra reading, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S or GSST 020 or GSST 020H or GSST 020S. Examines women's grassroots activism and organizing within the context of political and social structures, culture, and history at the local and global levels. Employs comparative and global perspectives to understand the diversity of women's issues and women's activism.

GSST 137 Critical Queer Politics 4 Lecture, 3 hours; individual study, 2 hours, written work, 1 hour. Prerequisite(s): one of the following courses: GSST 001, GSST 001H, GSST 001S; or consent of instructor. Presents Euro-American configurations of modern sexuality to map queer communities and homosexual presence across time and space. Critically explores the invisibilities, injustices, erasures, distortions, silences, and voices produced as a result of queer mobility, global gay, and global queer liberation. Cross-listed with LGBS 137.

GSST 139 Coming Out and Sexual Identity 4 Lecture, 3 hours; individual study, 1 hour; extra reading, 2 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S or GSST 002; or consent of instructor. Examines speech acts, secrecy, and silence to understand the significance of the closet. Explores perspectives on resistance movements and modes of communication related to coming out. Considers coming out stories, biographies, and examinations of the social construction of heterosexual identities and formation of public space.

GSST 140 Reproduction: Policies, Politics, and Practices 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines reproductive policies, politics, and practices from a cross-cultural and historical perspective. Discusses political and economic processes and sociocultural dynamics; population control; sex preference; infanticide and neonatal neglect; adoption and foster parenting; abortion; technologically assisted conception; and gestational surrogacy. Cross-listed with ANTH 144G.

GSST 142 (E-Z) 4 Seminar, 3 hours; extra reading, 3 hours. Covers comparative histories of feminist literary movements, gender and immigration, autobiography, translation, and subjectivity. Asian literature will be circulated in the original language to students with reading ability (not required).

GSST 143 The Sociology of Women 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S or SOC 001 or SOC 001H. Analyzes the role women have played in society emphasizing modern American society. Considers some of the social determinants of women's positions and the efforts being made to bring about change. Cross-listed with SOC 140.

GSST 145 Intersectionality, Ecology, and Community Design 4 Lecture, 3 hours; extra reading, 2 hours; research, 4 hours. Prerequisite(s): GSST 021. Introduces theoretical underpinnings of ecological utopias and ecotopias. Examines practical aspects of designing these intentional communities focused on sustainability. Includes discussion and critique of proposed ecotopias, analysis of egalitarian economic systems, inclusive and participatory political institutions, and social mores adopted by existing ecovillages and other sustainable intentional communities. Cross-listed with SEHE 145.

GSST 147 Feminist Animal Studies 4 Lecture, 3 hours; extra reading, 3 hours; written work, 3 hours. Prerequisite(s): GSST 001 or GSST 001S or LGBS 001; GSST 011 or GSST 020 or GSST 020H or GSST 020S or GSST 021 or GSST 022A or GSST 022B or GSST 030 or GSST 030H or GSST 031H or GSST 040 or GSST 010 or GSST 030S or GSST 010S. Examines human-animal relationships from a feminist perspective. Explores the use of animals as pets, subjects and objects of scientific research, and food sources. Analyzes how these uses relate to the exploitation of women and to feminist ethics. Considers the connections between sexism and speciesism.

GSST 148 Intersectionality, Ecology, and Design Science 4 Lecture, 3 hours; practicum, 3 hours; extra reading, 2 hours; field, 2 hours; written work, 2 hours. Prerequisite(s): GSST 145, may be taken concurrently. Introduces regenerative design. Emphasizes stability and resiliency of natural systems and intersectional praxis of environmental justice in agricultural and social design. Recognizes sustainable food, water, and shelter requires understanding structures of power that shape and maintain discrimination. Includes agroecology; climate; health; permaculture; intentional communities; social activism; and sustainability. Cross-listed with SEHE 148.

GSST 149 Gender, Kinship, and Social Change 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): one of the following courses: GSST 001, GSST 001H, GSST 001S. Examines theories of gender and kinship, the formation of gender hierarchies and their uneven development, and the dynamics of family and gender in stratified social formations. Analyzes the relationship between family forms and political and economic processes. Cross-listed with ANTH 149.

GSST 150 Gender and the State 4 Lecture, 3 hours; extra reading, 1 hour; research, 1 hour; written work, 1 hour. Prerequisite(s): GSST 001 or GSST 001S; restricted to class level standing of junior, or senior. Examines the various meanings of gender as it is articulated in, reproduced by, and shaped within the state. Discusses gender-state relations, as well as the engendering of politics, state functions, policy, and politics in various historical, political, cultural, and social contexts.

GSST 151 Islam, Women, and the State 4 Lecture, 3 hours; individual study, 2 hours; extra reading, 1 hour. Prerequisite(s): GSST 001 or GSST 001S or GSST 001H or ANTH 001 or ANTH 001W or ANTH 001H; restricted to class level standing of junior, or senior; or consent of instructor. Examines the links between women, Islamic practices, and the politics of state formation and nation building. Explores ways women constitute the terrain of struggle between the traditional and modern, colonialism and nationalism, and religion and politics. Cross-listed with ANTH 188.

GSST 154 Feminist Oral History: Theory, Methods, Praxis 4 Lecture, 3 hours; extra reading, 1 hour; written work, 1 hour; activity, 1 hour. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S, GSST 100 or GSST 100S or GSST 107 or GSST 123 or GSST 136 or GSST 188 or GSST 191B. Introduces the interdisciplinary methods and theories of feminist oral history. Topics include women of color critique, narration, positionality, listening, affect theory, archival concerns, and sound studies. Examines the relationship between narration, knowledge production, and power through an intersectional lens attentive to race, ethnicity, gender, sexuality, and class.

GSST 155 Women's Labor and the Economy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. A special-topics based labor economics

course. Focuses on one important dimension of worker differences: gender. Covers the topics of human capital, wages and employment, occupational choice, discrimination, the family as an economic unit, and public policy. Cross-listed with ECON 155, and PBPL 155.

GSST 157 Trans Studies: Identity, Embodiment, and Politics 4 Lecture, 3 hours; individual study, 3 hours; written work, 2 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S or LGBS 001; or consent of instructor. Focuses on core concepts and theories in trans studies. Addresses the origins of trans identity as a category as well as, the relationship between race, class, sexuality, and legal status. Explores how this relationship shapes trans experiences and trans culture across and beyond the binary.

GSST 158 Gender and Sexuality in U.s Religious History 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S or RLST 001 or RLST 001H or RLST 002 or RLST 003 or RLST 005 or RLST 005H or RLST 007 or RLST 007H or RLST 010 or RLST 012 or ETST 012 or RLST 012H or ETST 012H or RLST 014 or RLST 015 or RLST 015H or RLST 024 or HIST 034 or RLST 044 or HIST 044; or consent of instructor. Overview and analysis of gender and sexuality in religion from colonial period (including Spanish, French, Russian, and British colonies in what is now the United States) to present day. Combines critical and comparative religious studies approaches with historical methods and the analytical perspectives of intersectional gender, sexuality, and queer studies. Cross-listed with RLST 161.

GSST 159 Queer Religiosities 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S or RLST 001 or RLST 001H or RLST 002 or RLST 003 or RLST 005 or RLST 005H or RLST 007 or RLST 007H or RLST 010 or RLST 012 or ETST 012 or RLST 012H or ETST 012H or RLST 014 or RLST 015 or RLST 015H or RLST 024 or HIST 034 or RLST 044 or HIST 044. A comparative, thematic exploration of religion in the lives of contemporary same sex attracted and gender variant or gender nonconforming people around the world. Topics may include intersections of religion with: neoliberal economic and political strategies; globalization; global North/South inequities; settler colonialism; racial, economic, and gender inequalities; homonormativity/homonationalism; queer activism. Cross-listed with RLST 159.

GSST 160 Religion, Gender, and Sexuality 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examination of attitudes toward and images of women in diverse religious traditions. Includes issues such as the presence and absence of women in leadership roles; women's spiritual experiences; female founders of religious groups; and recent developments in feminist religious thought. Cross-listed with RLST 160.

GSST 161 Gender and Science 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Focuses on the intersections of Western constructions of gender and scientific knowledge since the sixteenth century. Considers the cultural and political roles of the scientist in terms of gender; the structuring of objectivity and objects of study; the status of scientific knowledge; and the emergence of feminist science studies. Cross-listed with SEHE 123. Credit is awarded for one of the following GSST 161, SEHE 123, GSST 161S, or SEHE 123S.

GSST 161S Gender and Science 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Focuses on the intersections of Western constructions of gender and scientific knowledge since the sixteenth century. Considers the cultural and political roles of the scientist in terms of gender; the structuring of objectivity and objects of study; the status of scientific knowledge; and the emergence of feminist science studies. Cross-listed with SEHE 123S. Credit is awarded for one of the following GSST 161S, SEHE 123S, GSST 161, or SEHE 123.

GSST 162 Women's Issues in Modern Muslim Thought 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one Religious Studies course or upper-division standing or consent of instructor. Introduces complex religious and social issues related to the role of women in modern Islamic societies ranging from North America to Southeast Asia. Examines Muslim writings produced during the past century. Cross-listed with RLST 162.

GSST 164 Reproductive Justice 4 Lecture, 3 hours; research, 1 hour; individual study, 3 hours; written work, 2 hours; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Introduces reproductive justice concepts of intersectionality, systemic oppression, the triple pillar approach, and human rights. Analyzes inequality and power in shaping the reproductive contexts of people's lives, behaviors, and outcomes. Cross-listed with SEHE 161.

GSST 165 (E-Z) Themes in Vietnamese Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. An exploration of Vietnamese literature in translation as seen through the lens of a particular theme or issue. Focuses on the implications of gender and sexuality on nation formation. All materials are read or viewed in English. E. Women And War. Cross-listed with AST 165 (E-Z), SEAS 165 (E-Z), and VNM 165 (E-Z).

GSST 166 Chicana/O Cultural Studies and Gender Politics 4 Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the field of Chicana/o cultural studies and investigates the gender politics that attest to its intersectional approach. Considers how power and gendered politics have impacted the restructuring of the split subject in Chicana/o cultural studies. Cross-listed with MCS 127.

GSST 167 Women and Gender in Postcolonial Africa 4 Lecture, 3 hours; extra reading, 1 hour; individual study, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores relations between Africa and the Western world. Examines systems of colonialism and globalization, women's issues, gender identity, and representation in postcolonial Africa. Highlights the impact of these issues on African society and the struggle against systematic practices of oppression that persist at the axis of race, gender, and sexuality.

GSST 168 Gender and Power in Muslim Societies 4 Lecture, 3 hours; extra reading, 1 hour; written work, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the dynamics of gender relations within the context of the Muslim world. Analyzes processes of power which influence concepts of femininity, masculinity, the body, and sexuality. Explores heterogeneity of the Muslim world as well as its unifying cultural and social history. Cross-listed with ANTH 189.

GSST 169 Gendering Revolution: Gender and Sexuality in "The Arab Spring 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): GSST 167 or GSST 168 or GSST 193; restricted to class level standing of junior, or senior. Addresses the gender politics of The Arab Spring focusing on revolutionary gender activism. Explores a world of dissent, chaos, and violence, but also one of beauty, ethics, and artistic expression as individuals come together to fight for "bread, freedom, and social justice."

GSST 170 Women Artists in Renaissance Europe, 1400-1600 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. Surveys the lives and work of women artists in Renaissance Europe. Considers circumstances under which it was possible for women to become artists; how they evolved from practicing in the cloistered convent to participating in the competitive public market place; what they painted; and who their patrons were. Cross-listed with AHS 165, and HISE 133.

GSST 171 Environmental Health and Social Justice 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S; GSST 020 or GSST 020H or GSST 020S or GSST 021; or consent of instructor. An interdisciplinary examination of the relationship between environmental health and social justice emphasizing gender, race, class, and globalization as analytical lenses. Topics include urban pollution, workplace exposure, industrial catastrophe, invisible environmental hazards, community activism, reproductive health, global capitalism, and new health challenges imposed by climate change. Cross-listed with SEHE 105.

GSST 173 Gender and Climate Change 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S; GSST 020 or GSST 020H or GSST 020S or GSST 021. Examines the global social

impacts of climate change that are magnified based on existing inequalities. Focuses on the disparity between men and women in their vulnerability and ability to cope with the global phenomenon. Investigates both women as "victims" of global warming and their positive roles in climate change mitigation. Cross-listed with SEHE 141.

GSST 175 Gender, Ethnicity, and Borders 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ETST 001 or ETST 001H or GSST 010 or GSST 010S or upper-division standing. Examines literary, theatrical, and visual sites where the "in-between" space of border cultures is mapped. Materials include autobiographies, testimonial literature, films, novels, performance scripts, and art. Focuses on the interplay of gender and ethnicity. Cross-listed with ETST 175.

GSST 178 Gender and Archaeology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): one of the following courses: ANTH 001, ANTH 001H, ANTH 001W, ANTH 005, GSST 001, GSST 001H, GSST 001S; or consent of instructor. Considers gender roles in ancient and historically recent human societies, as well as how gender has shaped archaeological investigation. Cross-listed with ANTH 178.

GSST 179 Gender, Media, and Latin America 5 Lecture, 3 hours; screening 3 hours; research 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Explores the way Latin Americans have thought of and represented gender across a variety of media including essays, film, novel, short story, and performance. Compares the possibilities and limitations of these media for representing gender in the Latin American context. Cross-listed with MCS 179, LNST 109, and SPN 179.

GSST 181 Feminisms and Environmentalisms 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S; GSST 020 or GSST 020H or GSST 020S or GSST 021. Explores women's and feminist involvement in environmental movements. Examines how gender shapes our relationships with and approaches to environmental problems in the United States and globally. Investigates intersections between feminist concerns (health, reproduction, mothering, gender equity, and social justice) and environmental issues (conservation, pollution and global warming, and sustainability). Cross-listed with SEHE 142.

GSST 182 Applied Feminist Studies 4 Seminar, 3 hours; field, 4 hours; written work, 2 hours; extra reading, 1 hour. Prerequisite(s): GSST 001 or GSST 001S or GSST 010 or GSST 010S, GSST 013 or GSST 013S or GSST 016 or GSST 016H or RLST 016 or RLST 016H or GSST 020 or GSST 020S; or consent of instructor. Advanced exploration of applied feminist studies through scholarship and direct participation in community work. Engages with the possibilities and challenges of feminist social change through non-profit, grassroots, and government work. Includes experience in a community setting (e.g., feminist organization).

GSST 183 Feminist Politics of Food 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S; GSST 020 or GSST 020H or GSST 020S or GSST 021; or consent of instructor. Explores politics of food using gender, race, class, and globalization as analytical lenses. Examines expressions of gender and sexuality in food consumption. Investigates relationships between diet and structural racism and between feminist politics and food movements. Topics include food and advertisement, industrial and sustainable agriculture, food security, health, and bioengineering.

GSST 185 Gender, Race, and Medicine 4 Lecture, 3 hours; written work, 1 hour; extra reading, 1 hour; individual study, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores the relationship between Western medicine and women, racial minorities, and non-Western citizens. Investigates how gender ideology, racial inequity, and colonialism shape the medical representation of bodies, sexuality, and pathology. Examines how patients have renegotiated their relationships with medicine through health movements and alternative healing practices. Cross-listed with ANTH 144F.

GSST 186 Gender, Power, and Shifting Identities 4 Lecture, 3 hours; extra reading, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores constructions of various identities (racialized, gendered, sexual, diasporic) in cross-cultural contexts. Examines contemporary issues and theorizations concerning the intersection and politics of race, gender, and identity.

GSST 188 Gender and Performance 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on theoretical debates that construct and inform relations between the concepts of gender and performance. Considers the ways gendered bodies have been represented in performance. A broad definition of performance is applicable, and texts cover photographs, films, dance, performance art, drama, and current events.

GSST 189 Gender, Technology, and the Body 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): one of the following courses: GSST 001, GSST 001H, GSST 001S, LGBS 001. Examines various technologies that alter the body. Investigates how technological interventions in the body reproduce and reshape gender ideologies in contemporary Western culture. Topics include cosmetic, sex-reassignment, and weight loss surgeries; reproductive, contraceptive, and medical technologies; anti-depressants; sex toys; and body piercing.

GSST 190 Special Studies 1 to 4 Individual study, 3 to 12 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Independent study and research by qualified undergraduate students. Course is repeatable to a maximum of 15 units.

GSST 191A Seminar in Gender and Sexuality Studies: Feminist Epistemologies 4 Seminar, 3 hours; extra reading, 2 hours; research, 1 hour. Prerequisite(s): GSST 100 or GSST 100S. Explores what constitutes knowledge in feminist research as well as knowledge production as a process. Examines the epistemological questions that feminist scholars and activists debate. Subject matter represents interdisciplinary feminist approaches.

GSST 191B Seminar in Gender and Sexuality Studies: Feminist Research Methods 4 Seminar, 3 hours; extra reading, 2 hours; research, 1 hour. Prerequisite(s): GSST 100 or GSST 100S, GSST 191A. Explores the development and definitions of feminist research methodologies. Analyzes debates within quantitative and qualitative social science research methods from a feminist perspective. Investigates ethical dilemmas in feminist research. Considers how research and activism are joined.

GSST 191C Seminar in Gender and Sexuality Studies: Research Practicum in Gender and Sustainability 4 Seminar, 3 hours; extra reading, 1 hour; research, 1 hour; term paper, 1 hour. Prerequisite(s): GSST 100 or GSST 100S; GSST 161 or SEHE 123 or GSST 161S or SEHE 123S. Provides interdisciplinary theoretical and practical experience in framing, developing, and implementing projects pertaining to sustainability, gender, and sexuality. Investigates how gender and sexuality shape and are shaped by local, national, and transnational approaches to such issues as climate change, food and water security, species diversity, and renewable resources.

GSST 195 Senior Thesis 4 Thesis 12, Prerequisite(s): GSST 100 or GSST 100S; senior standing; consent of instructor. Thesis composition under the guidance of a faculty member. Course is repeatable to a maximum of 8 units.

GSST 198G Grp Intrnshp: Gndr & Sxlty 1 to 12 Seminar, 1 hour; written work, 1 hour; internship, 2 to 32 hours. Prerequisite(s): GSST 001 or GSST 001S; and consent of instructor. Examines issues of gender, sustainability, queer justice, and social justice in non-profit and advocacy organizations. Includes supervised experience in community settings such as women's and LGBIT+ advocacy organizations and environmental and environmental justice organizations. Course is repeatable up to a maximum of eight units. Course is repeatable to a maximum of 16 units.

GSST 198I Individual Internship in Gender & Sexuality Studies 1 to 12 Seminar, 1 hour; written work, 1 hour; internship, 2 to 32 hours. Prerequisite(s): upper-division standing; consent of instructor. Examines gender issues in gender/sexualities advocacy organizations. Addresses methods of, support for, outreach by, and practices of gender advocacy workplaces. Includes supervised

experience in community settings such as a women's advocacy organization, a sexualities advocacy organization, or a gender-oriented organization. Course is repeatable to a maximum of 16 units.

Graduate Courses

GSST 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and department chair Addresses special curricular problems. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

GSST 292 Concurrent Analytical Studies in Gender and Sexuality Studies 1 to 4 Research, 3 to 12 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Taken concurrently with a 100-series course. Focuses on research, criticism, and written work. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

Professional Course

GSST 302 Teaching Practicum 2 to 4 Seminar, 2 hours; research, 1 hour; practicum, 1 to 2 hours; extra reading, 2 to 3 hours. Prerequisite(s): appointment as a teaching assistant in the Department of Gender and Sexuality Studies Supervised training for teaching in lower- and upper-division Gender and Sexuality Studies courses. Considers feminist pedagogy including gender and dynamics in the classroom; comparative and historical approaches to teaching about gender and sexuality; techniques for discussing sensitive topics; providing resource referrals for students facing gender or sexuality issues; preparation; grading written work; and student relations. Graded Satisfactory (S) or No Credit (NC)

Genetics, Genomics, and Bioinformatics

Subject abbreviation: GEN
College of Natural and Agricultural Sciences

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Peter W. Atkinson, Ph.D. (Entomology)
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Katherine A. Borkovich, Ph.D. (Microbiology and Plant Pathology)
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John M. Heraty, Ph.D. (Entomology)
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Tao Jiang, Ph.D. (Computer Science and Engineering)
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Engineering)
Joy Xiang, Ph.D. (Biomedical Sciences)
Tingting Xiang, Ph.D. (Bioengineering)
Huimin Zhang, Ph.D. (Molecular, Cell and Systems Biology)

Graduate Program

The Genetics, Genomics, and Bioinformatics Graduate Program (GGB) administers a program leading to the Ph.D. in Genetics, Genomics, and Bioinformatics. GGB is an interdepartmental program that includes faculty from the departments of Biochemistry, Botany and Plant Sciences, Computer Science and Engineering, Entomology, Environmental Sciences, Molecular, Cell, and Systems Biology, Nematology, Plant Pathology and Microbiology, and Statistics, as well as the Division of Biomedical Sciences.

The program is structured to allow maximum flexibility in the design of an individual student course program and research goals. A primary objective is to allow students to develop a capability in research as rapidly as possible, consistent with the student's initial preparation.

Students are expected to meet all general requirements of the Graduate Division as printed in the Graduate Studies section of this catalog.

Admission

Applicants with any B.A. or B.S. degree and an adequate background in the biological and/or computational sciences will be considered. The specific entry requirements include courses in genetics, biology, chemistry, calculus, computer science, and statistics. Please refer to the Program Guidelines for details. GGB evaluates applications on a continual basis from October to May, however, it normally considers applications for teaching and research assistantships at the same time as fellowships; therefore, students are strongly encouraged to complete their applications for admission and support as early as possible. Normally, fellowships are awarded in January, for students entering the following fall quarter.

Doctoral Degree

The program offers the Ph.D. degree in Genetics, Genomics, and Bioinformatics.

Course Work

The course curriculum consists of three core classes and one or more elective classes. The core curriculum is composed of one genetics, one genomics and one bioinformatics course, while one or more elective classes can be chosen from an area of a student's specialization.

Core Classes (breadth requirements)
Students will take one course from each of the following three areas (A-C).

(A) **Molecular Genetics**
GEN 203 – Advanced Genetic Analysis of Model Organisms or MCBL 221 – Microbial Genetics or BPSC/BCH 231 – Plant Genome

Students may choose other alternatives after approval by their guidance committee and graduate advisor.

(B) **Genomics**
GEN 241 (former GEN240A) – Advances in Genomics

(C) **Bioinformatics**
GEN 242 (former GEN240B) – Data Analysis in Genome Biology
GDIV 403 – Research and Scholarship Ethics; must be taken within one year of advancement to candidacy

Elective Classes (areas of specialization)

Students must take one or more classes from the following areas. Students can also choose elective courses other than the ones listed below after approval by their guidance committee and graduate advisor.

Genetics

- CMDB 201 – Molecular Biology
- GEN 206 – Gene Silencing
- CMDB/GEN/BCH 209 – Ribonucleic Acid (RNA) Biology
- BPSC/BIOL 148 – Quantitative Genetics
- BPSC/BCH 231 – Plant Genome
- BIOL/MCBL 221 – Microbial Genetics
- EEOB 214 – Evolutionary Genetics
- ENTX 204 – Genome Maintenance and Stability
- EEOB 216 – Theory of Evolution

Computational Biology and Statistics

- BPSC 234 – Statistical Genomics
- CS 141 – Intermediate Data Structures and Algorithms
- CS 100 – Software Construction
  CS 234 – Computational Methods for Biomolecular Data
- CS 238 – Algorithmic Techniques in Computational Biology
- GEN 220 – Computational Analysis of High Throughput Biological Data
- STAT 110 – Biostatistical Methods in Life Sciences
- STAT 155 – Probability and Statistics for Science and Engineering
- STAT 201A/B/C – Theory of Probability and Statistics (replaces 160A/B)
- STAT 201A/B/C – Elements of Probability and Statistical Theory
- STAT 160B – Elements of Probability and Statistical Theory
- STAT 161 – Introduction to Probability Models

Seminars

The GEN 261 seminar (Seminar in Genetics, Genomics, and Bioinformatics) must be taken every quarter.

Supplemental Courses

Students may wish to take additional courses to supplement their graduate training. These courses will be tailored to the specific student's needs and decided upon in consultation with their major professors.

Classes that emphasize genetics, genomics, bioinformatics and other related areas are given in the List of Potential Courses in the GGB Graduate Student Handbook.

Students should consider some training in the ethics of use of genetically modified organisms, impact of patents on application of bioinformatics/genomics data, and/or use of databases with bioinformatics/genomics information in a clinical setting.

Additional Units taken to maintain 12-unit course load

Graduate students will register for 12 units per quarter to maintain full-time status. These units will include any lecture and seminar courses taken for the quarter. Typically students will also register for Directed Research (GEN 297) prior to advancement to candidacy or Research for Dissertation (GEN 299) after passing the Qualifying Exam.

The Ph.D. is a research degree, and, accordingly, the goal of the program is to train students in the theoretical and experimental foundations of modern genetics. Students are strongly encouraged to participate in lab rotations, select a major professor and begin research work early in their training (during the first year of residence).

Written and Oral Qualifying Examinations

Students are advanced to candidacy following successful completion of a written preliminary examination and an oral qualifying examination.

The Oral Qualifying Exam is expected to be taken in-person with the student and all exam committee members physically present in the same room. Remote exceptions (attendance via video call) can be granted for up to two committee members by the GGB Graduate Advisor. However, at a minimum the student and the chair of the committee are expected to attend in-person. Any exceptions for remote attendance need to be well justified and are not a standard option.

Dissertation and Final Oral Examination

Successful completion of a final oral dissertation defense is also required.

The Final Defense is expected to be taken in-person with the student and all dissertation committee members physically present in the same location. Remote exceptions (attendance via video call) can be granted for up to two committee members by the GGB Graduate Advisor. Any exceptions for remote attendance need to be well justified and are not a standard option. Defenses are expected to be held in a video enabled room to support remote attendance for a larger audience as well as the committee members that have been approved to attend remotely.

Foreign Language Requirement

None

Teaching Requirement

Each student must have at least two quarters of teaching experience. This requirement may be satisfied by serving as a teaching assistant in a genetics-related course.

Professional Development Training

Ph.D. graduate students fulfill their professional training requirement through enrollment in GEN 261 and GDIV 403.

Normative Time to Degree

15 quarters

Masters Degree

The multidisciplinary interdepartmental graduate program in Genetics, Genomics, and Bioinformatics offers instruction and research training leading to the M.S. degree in Genetics, Genomics, and Bioinformatics. A Thesis (Plan I) or Comprehensive Exam (Plan II) M.S. degree in Genetics, Genomics, and Bioinformatics is available under special circumstances, when the work leading to the Ph.D. degree cannot be completed. Whether either of these options is appropriate will be decided by the student's Guidance Committee either at the end of the first year or the time of the oral qualifying examination. Reference the Minimum Degree Requirements for the Master's degree (for Plan I and Plan II) in the Graduate Studies section of the General requirements.

Graduate Courses

GEN 203 Advanced Genetic Analysis in Model Organisms 4 Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): BIOL 102 or equivalent; graduate standing or consent of instructor. Examines essential concepts in modern genetics. Focuses on universal principles of genetic analysis in prokaryotic and eukaryotic model organisms, emphasizing underlying concepts and logic. Develops skills reading primary scientific literature and critical thinking through analysis of landmark papers. Cross-listed with CMDB 203.

GEN 206 Gene Silencing 3 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing, BIOL 107A or CBNS 101; or consent of instructor. An in-depth coverage of mechanisms, functions, and applications of RNAi and related gene regulatory pathways guided by small RNAs such as siRNAs and miRNAs in plants and animals. Cross-listed with CMDB 206, and MCBL 206.

GEN 209 Ribonucleic Acid Biology 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BIOL 107A or CBNS 101 or equivalent; graduate standing; or consent of instructor. A comprehensive overview of the multiple functions of ribonucleic acid (RNA) in the cell. Topics include mRNA, rRNA, and tRNA function and metabolism; RNA catalysis and the "RNA world"; eukaryotic and bacterial non-coding RNAs; and bacterial riboswitches. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CMDB 209, and BCH 209.

GEN 220 Computational Analysis of High Throughput Biological Data 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): graduate students in a life sciences program or consent of the instructors; previous coursework in genetics/genomics, molecular biology, or cell biology. Enables those with no computer science background to handle high throughout biological data. Covers the Perl programming language; program design, implementation, and testing; relational databases; basic data structures and algorithms; and BioPerl. Includes skill building through analysis of real high throughput biological data. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

GEN 230 Molecular Plant-Microbial Interactions 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 120 or MCBL 120 or PLPA 120, or equivalents; graduate standing. A study of the physiology of host-pathogen interactions with emphasis on the metabolism of diseased plants, nature of pathogenicity, and defense mechanisms in plants. Cross-listed with PLPA 230, BPSC 230, and CMDB 230.

GEN 234 Statistical Genomics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102, STAT 231B; graduate standing; or consent of instructor. Examines statistical methods of genome analysis. Topics include screening for genetic markers, linkage analysis, linkage disequilibrium, and mapping genes for complex diseases and quantitative traits. Covers statistical techniques including analysis of least squares and maximum likelihood, Bayesian analysis, and Markov chain Monte Carlo algorithm. Cross-listed with BPSC 234.

GEN 241 Advances in Bioinformatics and Genomics 4 Lecture, 4 hours. Prerequisite(s): BCH 110C or BCH 110HC or BIOL 107A; BIOL 102; graduate standing. Strategies for genomic and bioinformatic studies with focus on the tools of the trade. Topics include the sequencing, assembly, and annotation of genomes, transcriptome analysis, similarity searching, pattern recognition, genome evolution, and phylogenetic analysis. Discusses papers from bacterial, fungal, plant, and metazoan systems.

GEN 242 Data Analysis in Genome Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): GEN 241; graduate standing. Introduction to algorithms, statistics, and data analysis programming for genomics. Covers the theory of analyzing large-scale genomics, profiling, phylogenetics, and drug discovery data. Introduces the corresponding data analysis programming techniques using command-line tools on a computer cluster and the programming environment R.

GEN 261 Seminar in Genetics, Genomics, and Bioinformatics 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BIOL 261, BPSC 261, ENTM 261, and PLPA 261.

GEN 270 Introduction to Video Bioinformatics 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to video bioinformatics. Includes microscopic techniques, live imaging, video computing, structure and function of cells, spatiotemporal dynamics, multi-scale analysis, disk and data storage, indexing and queries, image and video databases, and medical imaging and analysis techniques. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 270.

GEN 272 Introduction to Imaging Bioinstrumentation and Analysis 2 Lecture, 1 hour; laboratory, 3 hours; extra reading, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the instrumentation used to collect video images of cells and the methods used to analyze video data. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 272.

GEN 273 Live Imaging and Analysis of Cellular and Molecular Behaviors 2 Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): EE 272 or GEN 272; graduation standing; or consent of instructor. An introduction to video imaging methodologies used to capture the cellular and molecular dynamics and interactions in living cells. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 273.

GEN 274 Introduction to Medical Imaging and Analysis 2 Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to medical imaging. Includes associated computational techniques for x-ray imaging, computed tomography, magnetic resonance imaging, positron emission tomography, ultrasound, radiotherapy, and molecular imaging. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 274.

GEN 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing and consent of instructor and graduate advisor. Faculty-directed individual study on specially selected topics in genetics, genomics, and bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GEN 292 Concurrent Studies in Genetics, Genomics, and Bioinformatics 1 to 4 Research 3 To 12, Prerequisite(s): graduate standing; consent of instructor. Explores one or more graduate projects based on content related to an appropriate undergraduate course. Includes faculty guidance and evaluation. Taken concurrently with the undergraduate course.

GEN 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing. Directed research in genetics, genomics, and bioinformatics. Performed prior to advancement to candidacy in preparation for dissertation projects. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

GEN 299 Research For the Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing. Original research in genetics, genomics, and bioinformatics for preparation of the dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Global Studies

Subject abbreviation: GBST
College of Humanities, Arts, and Social Sciences

Juliann Emmons Allison, Ph.D., Director
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Committee in Charge

Juliann Emmons Allison, Chair, (Gender & Sexuality Studies)
Muhamad Ali (Religious Studies)
Christopher Chase-Dunn (Graduate Division)
John Cioffi (Political Science)
Rob Clark (Sociology)
Kim Yi Dionne (Political Science)
Farah Godrej (Political Science)
Tabassum "Ruhi" Kahn (Media & Cultural Studies)
Mariam Beevi Lam (Comp Lit & Lang)
Perry Link (Comp Lit & Lang)
Susan Ossman (Anthropology, Emeritus)
Fariba Zarinebaf (History)
Daryle Williams, Dean, *ex officio*

Major

Global Studies is designed to be a challenging, interdisciplinary, major that provides students with an understanding of processes and problems that transcend national boundaries. Global Studies majors investigate interconnections that have emerged through global historical processes, transnational mobilities and identities, supranational norms, laws, and institutions, as well as the dissemination of ideas, belief systems, literatures, and arts across borders. Global studies majors also investigate global causes and consequences of division, fragmentation, and conflict.

At UCR, Global Studies majors are expected to master general theoretical and historical literatures on global cultural and economic processes, while pursuing tailored expertise on a specific region or thematic area, such as global heath and the spread of disease, human rights and the politics of migration, global arts and media, global economic systems of trade and finance, or sustainability and environmental politics.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The major requirements for the B.A. degree in Global Studies are as follows:

Students will not be admitted into the major until they have completed either GBST 001 or GBST 002 with a "C-" grade or better.

1. **Lower-division requirements** (at least 21 units plus foreign language):
   a) GBST 001
   b) Two introductory courses (courses numbered 001–099) in each of two different disciplines.
   c) Proficiency in a foreign language at the fourth-quarter level
   d) Two courses in world history chosen from HIST 010 or HIST 010W, HIST 015, HIST 020, or HIST 020W
2. **Upper-division requirements** (32 units plus capstone):
   a) Students must select (6) six courses in at least two different disciplines from the thematic tracks below. At least one of these must be a 100-level GBST course. Students may opt to concentrate on one or two thematic tracks or to select a range of courses from different thematic tracks. Please note: students are responsible for fulfilling any prerequisites required for upper division courses.

Global Health, Sustainability, and Resources
ANTH 144E, ANTH 164, BPSC 165, ECON 129, ECON 143, ECON 148, ENGR 171, ETST 116, ETST 153, GBST 103, GBST 130/PBPL 130, GEO 157, GEO 160, GEO 167, GSST 145/SEHE 145, GSST 147, GSST 148/SEHE 148, GSST 161, GSST 171/SEHE 105, GSST 173/SEHE 141, GSST 181, GSST 183, HIST 107, MCS 108, MCS 122, PBPL 171/ENGR 171, POSC 106/SEHE 136, POSC 106S/SEHE 136S, POSC 137, POSC 137S, POSC 180, POSC 180S, PHIL 167, SOC 184

Global Institutions and Economics
ANTH 119, ANTH 136, ANTH 142J, BUS 114, BUS 138, BUS 154, BUS 164, BUS 178, ECON 124, ECON 173, ECON 175, ECON 178, ECON 181, ECON 185, ECON 187, ECON 188, ECON 189, ETST 102, ETST 109E, GBST 104, GBST 130, GBST 100, GSST 101, GSST 138, GSST 155, GSST 190, MCS 109, POSC 116, POSC 116S, POSC 126, POSC 126S, POSC 134, POSC 134S, POSC 136, POSC 136S, POSC 138, POSC 138S, POSC 150, POSC 150S, POSC 151, POSC 151S, POSC 158, POSC 164, POSC 164S, POSC 178, SOC 112, SOC 112S, SOC 135, SOC 135S, SOC 176, SOC 181, SOC 181S

Global Arts, Cultures, and Ideas
ANTH 108, ANTH 119, ANTH 126, ANTH 136, ANTH 140G/I/P, ANTH 163, ANTH 142G, ANTH 176, ANTH 178, AHS 115, AHS 163, AHS 178, CPLT 121, CPLT 123, CPLT 167, CPLT 166, CPLT 173 (E-Z), DNCE 123, DNCE 127, DNCE 128, DNCE 136, ENGL 136A/ENGL 136SA, ENGL 136B, ENGL 189, ENGL 101, ENGL 142N, ENGL 120T, ETST 100, ETST 118, ETST 119, ETST 121, ETST 148, ETST 166, ETST 175, GBST 100, GSST 123, GSST 146, GSST 151, GSST 162, GSST 167, GSST 171, HIST 130 A/B, HIST 137K, HIST 139, MCS 105, MCS 125E, MCS 127, MCS 129, MCS 130, MCS 144J, MCS 147, MCS 156E, MCS 173F/I/T, MCS 184, MCS 185, MUS 117, MUS 123, MUS 126, RLST 106, RLST 107, RLST 109, RLST 111, RLST 135A, RLST 135B, SOC 146, SOC 161, SPN 102A, SPN 102B, SPN 105, SPN 106, TFDP 176

War, Peace, and Justice
ANTH 182, CPLT 121, ETST 101A, ETST 101B, ETST 108E, ETST 111, ETST 112, ETST 177, GBST 110, GBST 140, GSST 109, GSST 125, GSST 136, HISA 160, HISA 184, MCS 188, MUS 118, PHIL 161, PHIL 164, PHIL 165, POSC 104, POSC 104S, POSC 107, POSC 110, POSC 110S, POSC 123, POSC 126, POSC 126S, POSC 129, POSC 132, POSC 132S, POSC 137, POSC 137S, POSC 140, POSC 150, POSC 150S, POSC 151, POSC 151S, POSC 152, POSC 159, POSC 159S, POSC 164, POSC 164S, SOC 122, SOC 146, SOC 161, SPN 165 RLST 116, RLST 117, RLST 124 (E-Z), RLST 113, RLST 136, RLST 155
   b) In consultation with their advisor, students must select (2) two upper division courses (8 units) in a single geographic region.
3. **Capstone requirement** (4 units)
   Students are required to complete their major with a capstone experience. The capstone must examine at least one global issue. Most students will satisfy this requirement by taking the Senior Thesis Seminar (GBST 193). Students may also conduct an individual project as part of a Global Studies upper division course or internship or while participating in UCDC program or education abroad program (EAP), with the approval of the Director of Global Studies.

Minor

1. **Lower-division requirements** (21 units)
   a) GBST 001
   b) Proficiency of a foreign language at the fourth quarter level
2. **Upper-division requirements** (16 units)
   4 Upper-division courses. Students must select four (4) courses with significant global content in at least two different disciplines; two (2) of these courses must be in a geographic area. Students may opt to concentrate on one or two thematic tracks or to select a range of courses from different thematic tracks. Please note: students are responsible for fulfilling any prerequisites required for upper division courses. Students must complete GBST 001 before enrolling in any upper division GBST courses.

Global Health, Sustainability, and Resources
ANTH 144E, ANTH 164, BPSC 165, ECON 129, ECON 143, ECON 148, ENGR 171, ETST 116, GBST 103, GBST 130/PBPL 130, GEO 157, GEO 160, GEO 167, GSST 145/SEHE 145, GSST 147, GSST 148/SEHE 148, GSST 161, GSST 171/SEHE 105, GSST 173/SEHE 141, GSST 181, GSST 183, HIST 107, MCS 108, MCS 122, PBPL 171/ENGR 171, POSC 106/SEHE 136, POSC 106S/SEHE 136S, POSC 137, POSC 137S, POSC 180, POSC 180S, PHIL 167, SOC 184

Global Institutions and Economics
ANTH 119, ANTH 136, ANTH 181, BUS 114, BUS 138, BUS 154, BUS 164, BUS 178, ECON 124, ECON 173, ECON 175, ECON 178, ECON 181, ECON 185, ECON 187, ECON 188, ECON 189, ETST 102, ETST 109E, GBST 104, GBST 130, GBST 100, GSST 101, GSST 138, GSST 155, GSST 190, MCS 109, POSC 116, POSC 116S, POSC 126, POSC 126S, POSC 134, POSC 134S, POSC 136, POSC 136S, POSC 138, POSC 138S, POSC 150, POSC 150S, POSC 151, POSC 151S, POSC 158, POSC 164, POSC 164S, POSC 178, SOC 112, SOC 112S, SOC 135, SOC 135S, SOC 176, SOC 181, SOC 181S

Global Arts, Cultures, and Ideas
ANTH 108, ANTH 119, ANTH 126, ANTH 136, ANTH 140G/I/P, ANTH 163, ANTH 142G, ANTH 176, ANTH 178, AHS 115, AHS 163, AHS 178, CPLT 121, CPLT 123, CPLT 167,

CPLT 166, CPLT 173 (E-Z), DNCE 123, DNCE 127, DNCE 128, DNCE 136, ENGL 101, ENGL 120T, ENGL 136A/ENGL 136SA, ENGL 136B, ENGL 142N, ENGL 189, ETST 100, ETST 118, ETST 148, ETST 166, ETST 175, GBST 100, GSST 123, GSST 146, GSST 151, GSST 162, GSST 167, GSST 171, HIST 130 A/B, HIST 137K, HIST 139, MCS 105, MCS 125E, MCS 127, MCS 129, MCS 130, MCS 144J, MCS 147, MCS 156E, MCS 173F/I/T, MCS 184, MCS 185, MUS 117, MUS 123, MUS 126, RLST 106, RLST 107, RLST 109, RLST 111, RLST 135A, RLST 135B, SOC 146, SOC 161, SPN 102A, SPN 102B, SPN 105, SPN 106, TFDP 176

War, Peace, and Justice
ANTH 182, CPLT 121, ETST 101A, ETST 101B, ETST 108E, ETST 111, ETST 112, ETST 177, GBST 110, GBST 140, GSST 109, GSST 125, GSST 136, HISA 160, HISA 184, MCS 188, MUS 118, PHIL 161, PHIL 164, PHIL 165, POSC 104, POSC 104S, POSC 107, POSC 110, POSC 110S, POSC 123, POSC 126, POSC 126S, POSC 129, POSC 132, POSC 132S, POSC 137, POSC 137S, POSC 140, POSC 150, POSC 150S, POSC 151, POSC 151S, POSC 152, POSC 159, POSC 159S, POSC 164, POSC 164S, SOC 122, SOC 146, SOC 161, SPN 165 RLST 116, RLST 117, RLST 124 (E-Z), RLST 113, RLST 136, RLST 155

Lower-Division Courses

GBST 001 Global History, Culture, and Ideas 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. A survey of the historical and cultural processes that have made the world more interconnected.

GBST 002 Global Socioeconomic and Political Processes 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): GBST 001 with a grade of "B" or better is recommended for freshmen. A survey of the economic, political, and physical processes that have made the world more interconnected.

GBST 003 Crossing Culture 1 Discussion, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): restricted to class level standing of freshman, sophomore, or junior. Covers logistics for all UCR Education Abroad needs, such as program types, application, funding, resources, and support. Explores intercultural competencies in depth, a key skill for the twenty-first century job force. Promotes transferring of learned skills proactively into the academic career and improves employment competitiveness.

GBST 090 Special Studies 1 to 3 Individual Study, 3 to 9 hours. Prerequisite(s): consent of program chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 8 units.

Upper-Division Courses

GBST 100 Global Cities 4 Lecture, 3 hours; field, 3 hours. Prerequisite(s): GBST 001 or GBST 002. A study of urban life as it has emerged in various parts of the world through application of theories of space and the city. Considers how colonialism, urban planning, migration, and trade have influenced contemporary urban environments. Projects explore the city as representation and lived experience in Riverside and Southern California.

GBST 101 (E-Z) Special Topics in Global Issues 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Explores current events in relation to Global Studies. Professors, guest speakers, and the topics addressed involve global issues. E. The Arab Spring. Course is repeatable as content or topic changes to a maximum of 8 units.

GBST 102 Global Meditation Practices and the Contemplative Traditions of South Asia 4 Seminar, 3 hours; extra reading, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. An overview of meditative traditions of South Asia that influenced global meditative practices. Investigates and compares distinctive traditions and their global political implications. Topics include the meaning and purpose of meditation, the influence of religious traditions, and the political implications of mediation. Includes regular practice of meditative and contemplative techniques

GBST 103 Food and Globalization 4 Seminar, 3 hours; extra reading, 3 hours; research, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Investigates globalization through the lens of food. Topics include world hunger, food security, agribusiness and health, genetically modified foods, sustainability, labor, migration, fast food, and "slow food." Introduces various research methods including analysis of statistics, semiotics, and the study of social interaction.

GBST 104 Global Economic Crisis 4 Seminar, 4 hours; research, 3 hours, written work 3 hours, extra reading, 3 hours. Prerequisite(s): GBST 001. Examines crises associated with neoliberal globalization, global finance, and recession beginning in the 1970s. Topics include the political economy of capitalism; variation in governmental response; political instability and crisis; origins of current global political economic crises affecting developed countries; and proposed remedies.

GBST 107 Non Western Political Thought 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Explores some of the key political thinkers, ideas, and cultural-religious legacies of non-Western societies. Addresses pertinent non-Western civilizations and crucial problems in comparative political theory. Provides a detailed analysis of political thinking in regions such as the Middle East, South Asia, and East/Southeast Asia. Cross-listed with POSC 107.

GBST 110 Global Migrations and Movements 4 Lecture, 3 hours; field, 3 hours. Prerequisite(s): GBST 001 or GBST 002. Examines migration and mobility (both global and interregional). Also addresses economic development and displacement of populations and issues of identity and subjectivity in the context of recent theories of mobility and globalization to understand how migration is reshaping borders, ideas of self, political and social entities, and transnational issues.

GBST 115 Ethnography: Collaborative/ Activist Interdisciplinary Research 4 Lecture, 3 hours; research, 2 hours; written work, 1 hour. Prerequisite(s): GBST 001; or consent of instructor. Explores the ethnographic methodologies that are the interdisciplinary tools researchers use to describe and document everyday lived lives. Engages through various practicum and independent research utilizing literary sources. Includes composition of a research proposal and video presentation of independent findings. Cross-listed with SEHE 115.

GBST 130 Management of International Water 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores basic concepts of international water law. Examines how these concepts, as well as conflict definitions, negotiation principles, and cooperation principles, are applied to international waters. Includes analysis of several major international water cases utilizing contemporary literature. Cross-listed with PBPL 130.

GBST 133 Mindfulness, Climate Action, and Resilience 4 Lecture, 3 hours; activity, 1 hour; written work, 2 hours; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Develops personal and social skills to respond to the climate crisis and interrelated global crises the (polycrisis). Reviews climate science and introduces the polycrisis concept. Develops mindfulness and other contemplative practices. Explores strategies for effective climate communication and action to navigate and build a meaningful future. Cross-listed with SEHE 133.

GBST 140 Haiti: Past, Present and Future 4 Lecture, 3 hours; discussion, 1 hour; research, 1 hour. Prerequisite(s): upper-division standing or consent of instructor .Focuses on Haitian history, ecology, earthquakes, political economy, and public health issues in world historical perspective. Incorporates presentations from experts and community activists on topics related to Haitian political, economic, and natural, and health history. Examines leadership skills needed in addressing poverty in the Global South.

GBST 148 Sound Studies and Sound Art 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduction to the interdisciplinary field of sound studies and sound art. Explores cultural, social, political, and philosophical issues of sound, listening, and auditory media. Examines the contemporary practices of sound production including the experimental field of sound art. Cross-listed with MUS 148.

GBST 169 From the Maghreb to the Middle East 4 Lecture, 3 hours; written work, 1 hour; individual study, 1 hour; extra reading, 1 hour. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or GBST 001 or GBST 002 or

consent of instructor. An introduction to the peoples and societies of North Africa and the Middle East. Follows the travels of Ibn Battutah, Ibn Khaldun, and Rafik al Tahtawi. Topics include religion, migration, gender, political organization, the global Middle East, Orientalism, and cultural production. Cross-listed with ANTH 169.

GBST 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): consent of program chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 15 units.

GBST 191 Seminar in Global Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines contemporary issues and topics in global studies that are not part of the regular curricular offerings. Content of the course varies and is announced as the course is offered. Course is repeatable to a maximum of 16 units.

GBST 193 Senior Seminar 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): senior standing or consent of instructor. Senior capstone course for global studies majors. Examines connections between students' academic experience and their plans for the future. Includes a research paper, as well as speakers on issues addressing professional choices in a global context.

GBST 195A Senior Thesis 4 Thesis, 12 hours. Prerequisite(s): senior standing; consent of instructor. Preparation of a substantial paper based on original research. The student works independently with a faculty member. May be undertaken as a one-, two-, or three-quarter course (GBST 195A, GBST 195B, GBST 195C).

GBST 195B Senior Thesis 4 Thesis, 12 hours. Prerequisite(s): GBST 195A. Preparation of a substantial paper based on original research. The student works independently with a faculty member. May be undertaken as a one-, two-, or three-quarter course (GBST 195A, GBST 195B, GBST 195C).

GBST 195C Senior Thesis 4 Thesis, 12 hours. Prerequisite(s): GBST 195B. Preparation of a substantial paper based on original research. The student works independently with a faculty member. May be undertaken as a one-, two-, or three-quarter course (GBST 195A, GBST 195B, GBST 195C).

GBST 198I Individual Internship in Global Studies 1 to 12 Internship, 2 to 24 hours; term paper, 1 to 12 hours. Prerequisite(s): consent of instructor. Internship in a public or quasi-public agency or business concern in matters relating to global studies. Requires a summary paper. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

Professional Courses

GBST 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 hours. Prerequisite(s): appointment as a teaching assistant; graduate standing. Supervised teaching in undergraduate Global Studies courses. Required of all Global Studies teaching assistants Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.

Graduate Division Courses

GDIV 301 Advanced University Level Pedagogy 4 Lecture, 4 hours. Prerequisite(s): permission by the department; graduate standing; and consent of instructor. Provides instruction in advanced university-level pedagogy. Explores teaching and lecturing strategies, effective teaching philosophies, effective evaluation techniques, and university-level teaching as a profession. Graded Satisfactory (S) or No Credit (NC).

GDIV 302 University Level Pedagogy Practicum 2 Practicum, 6 hours. Prerequisite(s): GDIV 301; graduate standing; and consent of instructor. Assists in developing and practicing effective teaching strategies on the university level through observation and experience. Graded Satisfactory (S) or No Credit (NC).

GDIV 403 Interdisciplinary Seminar: Research and Scholarship Ethics 1 Seminar, 2 hours. Prerequisite(s): graduate standing. Introduction to the core areas that influence the responsible conduct of research (RCR). Designed as an option to meet current federal regulations requiring students on specific federal funds to receive training in RCR. Graded Satisfactory (S) or No Credit (NC)

GDIV 405 Entering Mentoring: Building A Solid Foundation For Mentors 2 Seminar, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces best mentoring practices for supervision of research experiences. Uses material developed by the Center for the Improvement of Mentored Experiences in Research (CIMER). Topics include effective communication, diversity, equity, inclusion, and research ethics. Graded Satisfactory (S) or No Credit (NC).

GDIV 498I Individual Internship 1 to 12 Internship, 3 to 36 hours. Prerequisite(s): graduate student standing; consent of instructor and graduate advisor An internship in a UCR department or an approved academic institution in order to gain practical experience in academic administration or student services. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content changes to a maximum of 16 units.



HABLAMoS Medical Spanish, Designated Emphasis

School of Medicine

Ann Cheney (Professor SMPPH), Director
Jacqueline Moreira, Program Coordinator

Advisory Committee & Participating Faculty
Nuria Rico, SMPPH

Designated Emphasis Requirements

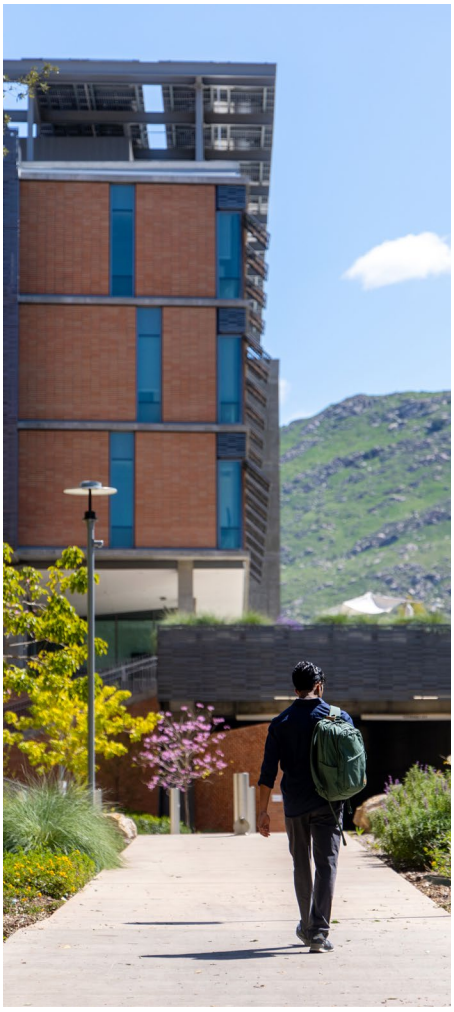
The Designated Emphasis in Medical Spanish or HABLAMoS (Hispanic and Bilingual Ambulatory Medical Studies) is a four-year language learning program that includes classroom instruction and experiential learning opportunities in Spanish-speaking clinics, communities, and families in Inland Southern California and urban and rural Spanish-speaking clinics. Students of all language levels can join the program in their first or second year of graduate or medical school. Students must complete a minimum of 200 hours of Spanish-language learning spread out across their graduate or medical education to receive the DE in Medical Spanish.

1. **Year one:** Builds the foundation for Spanish-language learning in medical contexts. Students receive one unit of selective credit on their transcript by completing the 17.5 hours for the medical Spanish selective.

Year 1	Total Number of Sessions	Hours/ Session	Total Possible Hours
Conversation lunch workshops	5	1	5
Grammar lessons	5	1.5	7.5
Clinic attendance	1	3	3
Modules/OSCEs	4	.5	2
Totals			**17.5**

2. **Year two:** Strengthens students' language skills and emphasizes oral communication in clinical encounters with Spanish-speaking patients and families. Students participate in a minimum of 12 hours of language learning. This includes 8 hours of case-based learning, taught by native Spanish-speaking physicians, 6 hours of conversational Spanish with native Spanish speakers.
3. **Year three:** Deepens students' medical Spanish vocabulary and cultural humility in the context of caring for Spanish-speaking patients. Students work independently on their written and oral language skills. Activities include up to 50 hours of independent completion of online language learning models via CanopyLearn, recipient of the National Institutes of Health (NIH) innovation award recipient.
4. **Year four:** immerses students in Spanish-speaking clinics and families in Inland Southern California and provides experiential learning into the cultural and structural factors that shape the health of Latino patients, patient-provider dynamics, and patient experiences in clinical spaces. Students can select from two activities: Clinical rotation: A four-week clinical rotation with a preceptor with a Spanish-speaking patient panel, 4 hours of online Medical Spanish classes, 4 hours of online Medical Spanish classes, 4 hours of anatomy and systems review, 3 hours of seminar, and a final public health talk. Scholarly Activity: A four-week scholarly activity involving the qualitative analysis of a Spanish-language dataset to inform evidence-based clinical practice. The activity includes 4 hours of online Medical Spanish classes, 4 hours of anatomy and systems review, 4 hours of seminar, 4 hours of conversation with a community health worker/promotora, and a final public health talk.

All requirements for the Designated Emphasis must be satisfied no later than one calendar year from the quarter in which candidate advances to candidacy in their PhD field or the final block in undergraduate medical education; a minimum GPA of 3.0 is required for the Designated Emphasis completion.



Healthcare Leadership Designated Emphasis

School of Medicine

Advisory Committee & Participating Faculty
Denise Martinez, HS Clinical Professor and Director

Designated Emphasis Requirements

The Healthcare Leadership Designated Emphasis builds a foundation of knowledge and wealth of skills for medical students to utilize as they work towards becoming the healthcare system leaders, including deans, CEOs, and CMOs. Students will develop self-awareness, leadership, and communication skills, and will learn to improve efficiency, reduce waste, and foster professional networks with peers, mentors, and community leaders. Any student is welcome to apply. There will be an application and subsequent interview. Up to 10 students will be accepted into the program. Students must complete a total of 304 hours of contact time divided up through the four years of medical school.

1. **Year one:** Students receive one unit of selective credit on their transcript by completing 14 of 20 available activity hours for the school year. These include: Self development and awareness, Improving efficiency and reducing waste in an organization, Guest speakers/class presentations, Leadership speaker series, and Mentorship program.

Year 1 Activity	Number of Sessions	Number of Hours/ Session	Number of Hours Available	Number of Hours Required
Leadership Speaking Series	4	1	4	4
Class Presentations	8	1	8	4
Mentorship	2	1	2	2
Self-Development & Awareness	1	1	1	1
6 Sigma	5	1	5	3
Totals			**20**	**14**

2. **Year two:** Taking principles from M.B.A., M.P.H. and M.P.P. programs, students receive one unit of selective credit on their transcript by completing 10 of 20 available activity hours for the school year. These include: lectures, case studies, and Mentorship program.

Year 2 Activity	Number of Sessions	Number of Hours/ Session	Number of Hours Available	Number of Hours Required
Public Policy	3	2	6	2
Public Health	3	2	6	2
Business Administration	3	2	6	2
Student choice of one of the above	1	–	–	2
Mentorship	2	1	2	2
Totals			**20**	**10**

3. **Year three:** Students will receive 12 units of selective credit on their transcript by completing 120 hours during their three-week selective. Students can earn the following grades while on their selective: honors, high pass, pass, or fail. Selectives include: Hands-on experience, Observation and formal report, Resource summaries, Mentorship of MS1 and MS2 students.

4. **Year four:** Students have the option of a scholarly activity block focused on leadership or participation in the Academic Medicine course. If opting for a scholarly activity, students are responsible for submitting the necessary completed documentation as indicated in the Student Handbook to ensure that they start on time. Students will receive 16 units of selective credit on their transcript by completing 160 hours during their four-week elective. Students can earn the following grades while on their selective: honors, high pass, pass, or fail. The elective includes: Hands-on experience, Capstone project, Resource summaries, Mentorship of MS1 and MS2 students.

Upon successful completion of the program across all four years, students will be given distinction on their Medical Student Performance Evaluation (MSPE) and receive a DE on their transcript. All requirements for the Designated Emphasis must be satisfied no later than one calendar year from the quarter in which candidate advances to candidacy in their PhD field or the final block in undergraduate medical education.

Hispanic Studies

Subject abbreviations: SPN and PORT
College of Humanities, Arts, and Social Sciences

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Claudia Holguín Mendoza
Benjamin Liu
Carlos Varón González

Assistant Professor
Iván Eusebio Aguirre Darancou

Assistant Professor of Teaching
Linda Lemus

**

Cooperating Faculty
Freya Schiwy (Professor, Media and Cultural Studies)

Director of Language Instruction
Linda Lemus

Lecturers
Mari Carmen Ballester
Yolanda Cárdenas
Dulce García
Nikolai Ingistov-García
Martín Navarro

Foreign Language Placement Examination
A placement examination is required of all freshmen entering the College of Humanities, Arts, and Social Sciences who wish to meet the foreign language requirement with the same language taken in high school. Consult the quarterly Schedule of Classes and placementtest.ucr.edu for date and time. Transfer students who have taken a college-level language course cannot take the placement examination and should consult with their advisors. No college-level credit may be duplicated. See college placement examination policy.

Major

The Department of Hispanic Studies offers a B.A. degree in Spanish. It offers the opportunity to double-major in Spanish and any other discipline; and to pursue a Spanish minor. A student may major in Spanish by completing the requirements in one of three areas of specialization, or options.

The **Literature Option** is intended for students who are interested in learning about the literary culture of Latin America and Spain. Students who choose the Literature Option will become versed in the analysis of writing, fiction, poetry, films, essays and criticism in Spanish, across historical periods and locations. This broad, liberal education prepares majors to pursue advanced graduate study in Latin American or Spanish literature. It prepares them for careers in educational policy, high school teaching, international relations, law, and many other professions.

The **Linguistics Option** is designed for students who are interested in bilingualism, Heritage Language or in Hispanic Linguistics. Students follow this option as preparation for advanced study in multiple fields -Hispanic Linguistics, Education, Language Science(s)- as preparation for K-12 teaching, or as a second major in fields where bilingualism or being bilingual is useful such as Ethnic Studies, the medical field(s), Sociology, Psychology or Anthropology, among others. We particularly encourage Heritage Language Speakers of Spanish, from any major, to pursue a specialization in Hispanic Linguistics.

The **Cultural Studies Option** is intended for students with an interest in the intersections of society, power, and culture. It offers an opportunity to acquire critical interdisciplinary skills in cultural analysis from a Hispanic perspective. It explores numerous forms of Spanish, Latin American and transatlantic cultural practices including film, television, philosophy, music, visual arts, performance, literature, testimonials, essays, and cultural critique. The Cultural Studies Option is relevant for students considering graduate study in Spanish, literature generally, history, international relations, or anthropology. It prepares students for careers in high school teaching, media work, advertising, creative arts, multimedia projects, and international studies.

All three options are suitable for double majors in all disciplines. Spanish majors very often double major in the fields of Anthropology, Classics, Comparative Languages and Literatures, Education, English, History, Latin American Studies, Philosophy, Psychology, Linguistics, Media and Cultural Studies, Music, or Sociology.

Education Abroad

The Department of Hispanic Studies encourages participation in Education Abroad. The Department regularly offers Faculty Led Education Abroad Programs (FLEAP) that offer UCR credit while learning abroad during Summer Sessions. Please consult with the faculty leader. UCEAP is another opportunity to learn abroad within the UC system. Spanish majors who choose to participate in UCEAP typically travel to Spain or Latin America to study in cities such as Madrid, or Barcelona, Buenos Aires, Santiago, Rio, San José, Mexico City, etc. Students should plan well in advance to ensure that the courses they take outside of the U.S. fit in your overall program at UCR. Consult the departmental student affairs officer for assistance. For details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog. Consult the Education Abroad office at UC Riverside for additional information on international opportunities.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The major requirements for the B.A. degree in Spanish are as follows:

Option Requirements — Choose one option

Cultural Studies Option
Upper-division requirements (11 courses [at least 44 units]):

1. SPN 101A and SPN 101B, or SPN 109A and SPN 109B
2. SPN 110 (prerequisite for all upper-division literature courses)
3. One course from SPN 122A, SPN 122B, SPN 165, SPN 188
4. Two courses from SPN 125 (E-Z)/MCS (E-Z)/LNST 125 (E-Z), SPN 145, SPN 171/MCS 171, SPN 172, SPN 179/MCS 179/LNST 109/GSST 179, SPN 185/MCS 185/LNST 185, SPN 187
5. Four upper-division elective courses (At least three of which must be in Spanish. One may be in a related area.)
6. SPN 193

Linguistics Option
Upper-division requirements (11 courses [at least 44 units])

1. SPN 101A and SPN 101B or SPN 109A and SPN 109B
2. SPN 105, SPN 106, SPN 107
3. SPN 110 (prerequisite for all upper-division literature courses)
4. Four upper-division elective courses (At least two of which must be in Spanish; it is highly recommended that students take LING 111 and LING 141)
5. SPN 193

Literature Option

Upper-division requirements (11 courses [at least 44 units])

1. SPN 101A and SPN 101B or SPN 109A and SPN 109B
2. SPN 110 (prerequisite for all upper-division literature courses)
3. SPN 180A or SPN 180B
4. SPN 181A or SPN 181B
5. Five upper-division elective courses in Spanish
6. SPN 193

The Department of Hispanic Studies recommends, for all three of the above options, the study of one of the other languages (besides Spanish) spoken in Latin America, the Caribbean, or Spain, such as Portuguese (PORT 101A, PORT 101B, PORT 101C) and French. Less commonly taught languages such as Aymara, Catalan, Euskera, Galician, Guarani, Haitian Creole, Mapuche, Maya, Nahuatl, and Quechua, among others, are encouraged.

Minor

Requirements for the minor in Spanish are as follows (24 units):

1. SPN 101A and SPN 101B or SPN 109A and SPN 109B
2. SPN 110
3. Three upper-division courses in Spanish

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Graduate Program

The Department of Hispanic Studies offers the M.A. and Ph.D. degrees in Spanish.

The graduate program in Spanish prepares scholars for university teaching and research in Spanish and Latin American literature, linguistics, and/or cultural studies. It is organized primarily for students seeking the Ph.D. degree, although the M.A. degree is awarded in the course of a student's progress.

The faculty in Hispanic Studies offers a wide and diverse group of graduate courses in literary, linguistic and cultural studies. Research and teaching interests include all areas of Spanish and Latin American literature from its origins to the present. Faculty also have strong research and teaching profiles in the theory and practices of translation; cultural studies, including Latin American film, gender studies, theories of the body, historiography and fiction; psychoanalysis; bilingualism and heritage language studies; Spanish in the US; sociolinguistics; and philosophy, including aesthetics, philosophies in Latin America and the Caribbean, and contemporary political philosophy.

Admission

The Department of Hispanic Studies invites highly qualified candidates from any discipline to apply. We welcome applicants with degrees (for example) in linguistics, literature (Hispanophone as well as Comparative or other literatures), philosophy, psychology and art history. Candidates will be ranked and selected according to the following criteria: excellent writing skills; creativity and originality; desire to engage with the academic community through professionalization and interdisciplinary research; high academic achievement; willingness to place issues of diversity at core of research project; research experience; and matching of expertise with existing faculty. Faculty will recommend candidates for admission after a careful consideration of submitted materials, including the statement of purpose, the writing sample, the personal and diversity statements, the candidate's previous academic background, and the letters of recommendation.

Teaching Assistantships

Most students in the program are Teaching Assistants in the Department of Hispanic Studies; their normal workload includes language teaching and taking three graduate courses per quarter. Teaching Assistants receive training in language instruction as part of their graduate study and teaching duties.

Professional Development

All students must take the series SPN 301 Teaching Spanish at the College Level (2 credits) and SPN 302 Teaching Practicum (1 to 4 credits) to meet the requirements for teaching and pedagogical training.

Students are also required to take SPN 220 Criticism and Critical Documentation (4 credits), a course on critical approaches to reading that also offers practice in Modern Language Association (MLA) documentation, publishing, and an overview of major professional conferences.

Foreign Language Requirement

In addition to Spanish and English, the candidate must demonstrate a reading knowledge of one other language. The choice of language should be guided by the candidate's research needs and interests and is to be made in consultation with the graduate advisor, prior to completion of the language requirement. This requirement can be fulfilled through a departmental examination of written proficiency conducted at the time of the MA examination, by passing a designated language course (e.g., FREN 009A, FREN 009B, GER 002R), or by alternative certification (such as a diploma from a foreign language institute or an accredited university course).

Master's Degree

The Department of Hispanic Studies offers the M.A. in Spanish.

The M.A. in Spanish is awarded to students in the PhD program who successfully complete the coursework and examination requirements. As part of their preparation in Hispanic literary and cultural studies and linguistics, students are introduced to current debates in cultural studies, literary theory, bilingualism and second language acquisition. Exceptionally, students who do not intend to pursue the PhD may seek a terminal M.A. degree.

Course Work

Students complete 72 graduate units in two years that also include our professional development courses SPN 220 (4 units) and the series SPN 301 (2 units)/SPN 302 (2 units).

Of those 72 units, students must take 48 units in required courses. Students specializing in Linguistics must take at least six courses in that field and four courses in Literature and Cultural Studies. Students specializing in Literature and Cultural Studies must take at least six courses in that field and four courses in Linguistics.

In addition to the following courses in Hispanic Studies, students may fulfill their requirements by taking courses approved by the graduate advisor in different Departments.

Linguistic Courses (4 credits each course)

SPN 203, SPN 207, SPN 208, SPN 275, SPN 278

Literature and Cultural Studies Courses (4 credits each course)

SPN 251, SPN 257, SPN 258 (E-Z), SPN 261 (E-Z), SPN 262, SPN 264, SPN 269 (E-Z), SPN 270 (E-Z), SPN 271, SPN 272, SPN 273 A, SPN 273 B, SPN 273 C, SPN 274, SPN 275, SPN 276, SPN 278, SPN 279

The department strongly encourages M.A. students to consult with the graduate advisor to ensure they take courses in a variety of different fields.

Students are required to participate in all scholarly events organized by the department.

M.A. Examination

Near the end of this two-year program, students take an examination, written at home and due 24 hours after it is assigned, followed by a one-hour oral examination administered one or two weeks after the written examination. These M.A. examinations (written and oral) are based on the texts in the M.A. reading list. Please, consult the departmental website for an updated version of the M.A. reading list.

The oral examination will be conducted by a committee nominated by the graduate advisor.

Oral Examination Modality

The M.A. Oral Examination can be taken in one of the following modes: Hybrid, Remote, or In Person. The student and the graduate advisor will discuss which mode best suits the subject matter and if the student's presence on campus is required. The graduate advisor will make the final determination on both questions. A Hybrid mode will be defined when there are at least two persons (committee member or student) physically present on campus. Whether on campus or from a remote location, the student is required to take the exam in a quiet and video enabled room. If students take the exam off campus, they're expected to be only by themselves. At least one of the committee members is expected to be on campus in a video enabled room that supports some members physically present and others remote. All members are always permitted to be remote. If Remote is chosen, all committee members and student have the option to attend remotely. If In Person is chosen, all are expected to be present on campus.

Portfolio Requirement

Candidates who hold the M.A. from UCR must

be recommended by the faculty to continue for the Ph.D. Successful candidates must have completed the portfolio requirement.

At the end of their MA coursework, students must present a portfolio with a writing sample (5000 words research paper) demonstrating the command of the scholarly, critical, and analytical requirements of their fields. The portfolio will also include a statement of purpose describing the intended doctoral research project. The writing sample will typically consist of an expanded version of an essay submitted for a graduate seminar, revised for submission for publication in a scholarly journal.

Normative Time to Degree
M.A. degree is 2 years.

Doctoral Degree

The Department of Hispanic Studies offers the Ph.D. in Spanish to train students for academic positions as scholars and teachers, and for alternative academic careers in which research, analysis and writing skills at the doctoral level are most useful. (For instance, in editing, publishing, educational policy, foundation governance, arts administration, and so on.)

The program emphasizes advanced coursework and independent research, culminating in the doctoral dissertation. It is designed to provide in-depth coverage of the student's primary area of study, while also ensuring ample coverage of the broad field of Hispanic Studies.

Admission
Students admitted with the M.A. from other institutions will join the doctoral program directly and take courses as required. Graduate students must always be enrolled in three different courses per term throughout their studies at UCR. Candidates who hold the M.A. from UCR must be recommended by the faculty to continue for the Ph.D. Successful candidates must have completed the portfolio requirement.

Course Work
The Ph.D. program requires a minimum of 24 units beyond the 72 units required for the M.A. As part of the 24 units students are required to take the professional development courses, SPN 220 (4 credits) and the series SPN 301 (2 credits) SPN 302 (2 credits). In practice, doctoral students usually find that more than the minimum is advisable for doctoral training. Once they have completed their qualifying examinations, students can work independently with their dissertation committee members by enrolling in Research for Dissertation courses (SPN 299).

Qualifying Examinations: Long Paper and Oral Examinations
Students choose two areas of concentration as examination areas. One area is the field of major emphasis; a second area or topic is selected in consultation with the chair of the qualifying committee. The doctoral examination includes the writing of the long paper followed by an oral examination of approximately two to three hours.

As part of their preparation in their major area of specialization, students submit a long paper (12,500 words) under the supervision of their dissertation advisor. The long paper will represent scholarly research and analysis in their chosen field of study. After approval from the dissertation advisor, students will distribute the paper to the faculty members of the qualifying committee.

The oral examination will be scheduled at least one week after submitting the long paper. The oral examination deals with the major and secondary areas and the long paper. In preparation for the oral examination, the qualifying committee will give the doctoral candidate written feedback in form of comments, questions, or prompts that will frame and guide the oral examination.

The long paper and oral examinations are conducted by the qualifying committee nominated by the graduate advisor in consultation with the student and appointed by the graduate dean. Upon the successful completion of the written and oral qualifying examinations, the student is recommended to the graduate dean for advancement to candidacy.

The qualifying committee, usually reduced to three members, typically becomes the dissertation committee.

Qualifying Oral Examination Modality
The Oral Qualifying Examination can be taken in one of the following modes: Hybrid, Remote or In Person. The student and the chair of the qualifying committee will discuss which mode best suits the subject matter and if the student's presence on campus is required. The chair of the qualifying committee will make the final determination on both questions. A Hybrid mode will be defined when there are at least two persons (committee member, chair of the qualifying committee or student) physically present on campus. Whether on campus or from a remote location, the student is required to take the exam in a quiet and video enabled room. If students take the exam off campus, they're expected to be only by themselves. At least one of the committee members is expected to be on campus in a video enabled room that supports some members physically present and others remote. The chair of the qualifying committee is not required to be physically present. If remote, the chair of the qualifying committee can moderate the discussion or choose to delegate that task to a committee member who is physically present. All members, including external members, are always permitted to be remote. If Remote is chosen, all committee members and student have the option to attend remotely. If In Person is chosen, all are expected to be present on campus.

Dissertation and Final Oral Examination
Students prepare a dissertation presented as prescribed by the Graduate Division under the direction of the candidate's dissertation committee. After completion of the dissertation, the candidate is examined by the dissertation committee. This examination (or final defense) normally takes the form of a public presentation by the candidate followed by questions from the committee.

Final Oral Examination Modality
The Final Defense can be taken in one of the following modes: Hybrid or Remote. The student and the chair of the dissertation committee will discuss which mode best suits the subject matter and if the student's presence on campus is required. The chair of the dissertation committee will make the final determination on both questions. A Hybrid mode will be defined when there are at least two persons (committee member, dissertation chair or student) physically present on campus. Whether on campus or from a remote location, the student is required to take the exam in a quiet and video enabled room. If students take the exam off campus, they're expected to be only by themselves. At least one of the committee members is expected to be on campus in a video enabled room that supports some members physically present and others remote. The chair of the dissertation committee is not required to be physically present. If remote, the chair of the dissertation committee can moderate the discussion or choose to delegate that task to a committee member who is physically present. All members, including external members, are always permitted to be remote. If Remote is chosen, all committee members and student have the option to attend remotely.

Normative Time to Degree
Ph.D. degree (students entering with the B.A.),is 5 years. Ph.D. degree (students entering with the M.A.), is 3 years. is 5 years. Ph.D. degree

Spanish

Lower-Division Courses

SPN 001 Elementary Spanish 4 Lecture 4, Prerequisite(s): Student is required to take Spanish placement examination. An introduction to the sound system and grammar of Spanish, with attention to the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in Spanish insofar as possible. Audio-lingual and computer-based learning materials are available in the language laboratory.

SPN 002 Elementary Spanish 4 Lecture, 4 hours. Prerequisite(s): SPN 001 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of Spanish, with attention to the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in Spanish insofar as possible. Audio-lingual and computer-based learning materials are available in the language laboratory.

SPN 003 Elementary Spanish 4 Lecture, 4 hours. Prerequisite(s): SPN 002 with a grade of "C-" or better or equivalent. An introduction to the sound system and grammar of Spanish, with attention to the development of the four skills: understanding, speaking, reading, and writing. Classes conducted in Spanish insofar as possible. Audio-lingual and computer-based learning materials are available in the language laboratory.

SPN 004 Intermediate Spanish 4 Lectur, 4 hours. Prerequisite(s): SPN 003 with a grade of "C-" or better or equivalent. A comprehensive review of the basic grammatical structures of Spanish, vocabulary building, development of conversation and composition skills, and readings of literary and social interest. Classes conducted in Spanish.

SPN 005 Intermediate Spanish 4 Lecture, 4 hours. Prerequisite(s): SPN 004 or equivalent. A comprehensive review of the basic

grammatical structures of Spanish, vocabulary building, development of conversation and composition skills, and readings of literary and social interest. Classes conducted in Spanish.

SPN 006 Intermediate Spanish 4 Lecture, 4 hours. Prerequisite(s): SPN 005 or equivalent. A comprehensive review of the basic grammatical structures of Spanish, vocabulary building, development of conversation and composition skills, and readings of literary and social interest. Classes conducted in Spanish.

SPN 012 Myths and Cultures of Latin America, the Caribbean, and Spain: Transatlantic Currents 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Examines cultural themes from a transatlantic perspective, through study of literature, film, and visual arts. Topics include chronicles of the conquest, cultures of the baroque, religious traditions and conflicts, the incorporation of popular culture into the literary tradition, contemporary writers, and cinema. Course is conducted in English.

SPN 046 Introduction to Latin American Film 5 Lecture, 3 hours; screening, 3 hours, discussion,1 hour. Prerequisite(s): none. Provides an historical overview of Latin American film production. Introduces students to film industries, revolutionary cinema, the role of television, and recent international co-productions. Cross-listed with MCS 046.

SPN 090 Special Studies 1 to 3 To be taken with the consent of the Chair of the Department as a means of meeting special curricular problems. Course is repeatable.

Upper-Division Courses

SPN 101A Advanced Oral and Written Composition 4 Lecture, 3 hours; extra reading, 1.5; written work, 1.5 hours. Prerequisite(s): SPN 006. Designed for nonnative speakers to practice speaking and writing in Spanish and to review basic grammar. Emphasis is on composition, editing, and conversation practice. Class is conducted in Spanish. Native speakers without knowledge of college-level grammar should take SPN 109A. Credit is awarded for only one of SPN 101A or SPN 109A.

SPN 101B Advanced Oral and Written Composition 4 Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): SPN 101A. Designed for nonnative speakers to practice speaking and writing in Spanish and to review basic grammar. Emphasis is on composition, editing, and conversation practice. Class is conducted in Spanish. Native speakers without knowledge of college-level grammar should take SPN 109B. Credit is awarded for only one of SPN 101B or SPN 109B.

SPN 102A Introduction to Spanish Culture 4 Lecture, 3 hours, extra reading, 3 hours. Prerequisite(s): SPN 101B or SPN 109B or equivalent. Introduction to Spanish culture and civilization from the Roman times to the present. Readings cover history, art, architecture, literatures, and other aspects of culture and civilization. Provides background for courses on the literature of Spain. Course is taught in Spanish.

SPN 102B Introduction to Latin American Culture 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 101B or SPN 109B or equivalent. Introduction to Latin American culture and civilization from pre-Columbian times to the present. Emphasis is on the period from postcolonial independence to the present. Readings cover history, art, architecture, literatures, and other aspects of culture and civilization. Provides background for courses on the literature of Latin America. Course is taught in Spanish.

SPN 103 Spanish Culture and Civilization in Spain 4 Lecture, 60 hours per quarter; discussion, 20 hours per quarter. Prerequisite(s): SPN 101B or SPN 109B; consent of instructor. Provides intensive study of Spain within its European and New-World contexts. Emphasizes expansion and retraction, as well as the roles of religion and authority. Course taught in Spain in Spanish. Offered in summer only.

SPN 104 An Introduction to the Study of Spanish and Comparative Linguistics 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. An introduction to the study of Spanish and comparative linguistics. Cross-listed with LNST 104.

SPN 105 The Phonology of the Spanish Language 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): LING 020; SPN 101A, SPN 101B or SPN 109A, SPN 109B; or consent of instructor. Provides a descriptive and normative analysis of the phonological system of the Spanish language. Focuses on the phonetic characteristics of contemporary Peninsular and Hispano-American Spanish. Cross-listed with LNST 106.

SPN 106 Structure of the Spanish Language 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 105 with a grade of C- or better or LNST 106 with a grade of C- or better. An introduction to descriptive and applied techniques in the morphosyntax of the Spanish language as found in Spain and Spanish America.

SPN 107 Spanish in the United States 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A sociolinguistic study of the Spanish language in the United States. Cross-listed with LNST 107.

SPN 109A Spanish For the Native Speaker 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): a sufficiently high test score on the Spanish placement examination, as determined by the Hispanic Studies faculty. Designed for the native speaker with little or no experience with Spanish grammar and composition. Emphasis is on basic grammar, written accents, orthography, and composition. The class is conducted in Spanish. Credit is awarded for only one of SPN 101A or SPN 109A.

SPN 109B Spanish For the Native Speaker 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 109A. Designed for the native speaker with little or no experience with Spanish grammar and composition. Emphasis is on basic grammar, written accents, orthography, and composition. The class is conducted in Spanish. Credit is awarded for only one of SPN 101B or SPN 109B.

SPN 110 Introduction to Literary Criticism and Analysis 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 101A, SPN 101B or SPN 109A, SPN 109B. An introduction to the methods and techniques of literary analysis. Practice in textual explication, with regular writing assignments.

SPN 111 (E-Z) Hispanic Literature in Translation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Reading and discussion of works of major Spanish and Spanish American writers. Topic will vary from quarter to quarter. F. Latin American Literature And Film; M. Masterpieces In Spanish American Modernism; Q. <i> Don Quijote; R. Theatre Of Spanish Golden Age; T. Latin American Theatre In Translation; W. Women In Latin American Literature. No Knowledge Of Spanish Required. May Be Counted Toward The Spanish Major With Consent Of Instructor.

SPN 120A Major Topics in Hispanic Literature 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 110. Reading and analysis of short texts of authors from Spain, Latin America, and the United States.

SPN 120B Major Topics in Hispanic Literature: Spain 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 110. Reading and analysis of major texts of authors from Spain.

SPN 120C Major Topics in Hispanic Literature: Latin America 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 110. Reading and analysis of major texts of authors from Latin America. Cross-listed with LNST 120.

SPN 122A Introduction to Hispanic Cultural Studies 4 Lecture, 3 hours; extra reading, 2.5 hours; screening, 6 hours. Prerequisite(s): SPN 110.An introduction to cultural studies in Latin America and Spain. Explores the relation between high and popular culture, mass media and subcultures, stories and history, narrative and memory, representation and gender, and technology and the notion of "alterity."

SPN 122B Transatlantic Cultural Studies 4 Lecture, 3 hours; extra reading, 2.5 hours; screening, 6 hours. Prerequisite(s): SPN 110.Offers a transatlantic cultural studies perspective that explores the shared histories of Spain, the Caribbean, and Latin America. Examines issues such as the legacies of the conquest of America and the slave trade, the nation-building process, theories of mestizaje and transculturation, and transatlantic exile.

SPN 123 (E-Z) Mexican Literary and Cultural Studies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): vary segment to segment; see individual segments for prerequisite information; or consent of instructor. Introduces a cultural studies approach to Mexican texts and theorists.

Covers issues of nation-building, urbanization, modernization, mestizo imaginaries, representations of violence, gender and nation, indigenismo, race and ethnicity, and borders and migration. Involves reading and discussions of cultural criticism, film, visual culture, and literary texts.

SPN 123E Mexican Modernities 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 110; or consent of instructor. Introduction to the construction of Mexico as a modern nation in popular, mass, and literary cultures from the 19th to mid-20th century. Focuses on the phenomenon of cultural nationalism through the critical discussion of multiple modernities in competition. Analyzes literature, film, and visual culture.

SPN 123F Global Mexico 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Continues the study of Mexican cultural development. Focuses on Mexican cultural politics and dynamics from post-1960s up to current times. Analyzes literature, film, and visual culture. Topics may include state violence, neoliberal culture, globalization, indigenous cultural production, migration, border narratives, women's literature, Nuevo Cine Mexicano, and Mexploitation.

SPN 123G Nation of Women 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 110; or consent of instructor. Introduces the intervention of women as cultural producers throughout Mexican history (17th to the 21st century). Focuses on convergences and divergences between high and low/popular and mass culture through a gender studies approach. Analyzes literature, film, visual culture, and music.

SPN 125 (E-Z) Topics in Latin American Film and Media 5 Lecture, 3 hours; extra reading, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Intensive formal, historical, and theoretical analysis of a theme or issue in Latin American film and media. Cross-listed with LNST 125 (E-Z), and MCS 125 (E-Z).

SPN 130 Digital Dialectology 4 Lecture, 4 hours. Prerequisite(s): SPN 101A, SPN 101B or SPN 109A, SPN 109B; or consent of instructor. Contemporary approach to the study of dialects. Examines the uses and projections of a natural language within a digital realm for both digital or analogical materials. Also studies the different interactions between two or more languages or dialects in the digital production of an individual and how those affect communities.

SPN 140 (E-Z) Renaissance and Baroque Literatures 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 110. A concentrated study of a genre, movement, author, or outstanding work of Spanish literature of the sixteenth or seventeenth century. E. Renaissance And Baroque Literature; H. La Celestina; J. Golden Age Of Poetry; P. La Novela Picaresca; T. Spanish Theatre Of The Golden Age.

SPN 141 Cervantes 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 110. An overview of Cervantes' texts within their time and place; discussion of his importance in the development of the novel; and close reading of Don Quixote.

SPN 142 Continuities of the Spanish Golden Age in Modern Latin America 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 110. Introduces the relationship of key golden age and Spanish colonial texts to modern Latin American narrative and essay. Explores questions of literary genealogy as well as issues of cultural identity and the reclamation of history.

SPN 145 Performative Expression in Contemporary Latin American Culture 4 Lecture, 3 hours; screening, .5 hours; individual study, 2.5 hours. Prerequisite(s): SPN 110. Addresses divisions and continuities between word and action and art and politics in Latin American short stories, films, and Web projects. Explores performative language that questions separations between saying and doing. Considers performance art as the disruption--or reiteration--of frameworks dividing artistic production from reality. Conducted in Spanish.

SPN 155 The Generation of 1898 4 Lecture, 3 hours; individual study 3 hours. Prerequisite(s): SPN 110. A study of the major writers constituting the generation emerging from the national conflict produced in Spain as a consequence of the defeat in the Spanish American War. Readings and discussion of essays, fiction, and poetry of writers such as Unamuno, Baroja, Valle-Incln, Antonio Machado, Azorn, and Benavente.

SPN 160 (E-Z) Studies in Twentieth-Century Spanish Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 110. A concentrated study of a genre, period, author, or outstanding work of twentieth-century Spanish literature. E. Spanish Poetry; N. Contemporary Novel In Spain; T. Contemporary Theatre In Spain.

SPN 165 Spanish and Latin American Cultural Studies: Violence and Representation 4 Lecture, 3 hours; screening, 1 hour; extra reading 2, hours. Prerequisite(s): SPN 110. Introduces students to a cultural studies approach to Latin American and Spanish texts and theorists. Covers the Southern Cone dictatorships, post-Franco Spain, and emerging urban imaginaries. Involves readings and discussions of cultural criticism, films, urban chronicles, and literary texts.

SPN 170 (E-Z) Studies in Nineteenth- and Twentieth-Century Latin American Literature 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SPN 110. A concentrated study of a genre, movement, author, or outstanding work of Latin American literature. E. Short Story; F. Censorship, Self-censorship, Anti-censorship; L. Nineteenth-century Latin American Novel; M. Twentieth-century Latin American Novel; N. Mexican Novel; P. Poetry; R. Voyages Through Latin America: A Cultural And Literary Vision; T. Spanish American Theatre.

SPN 171 Reel to Real: Latin American Film and Social Change 4 Seminar, 3 hours; screening, 3 hours. Prerequisite(s): SPN 110. Introduces Latin American film as it articulates with contemporary history and current events. Cross-listed with MCS 171.

SPN 172 The Testimonio and Cultural History 4 Lecture, 3 hours; extra reading, 3. Prerequisite(s): SPN 110. Explores the relation between the testimonial genre and the emergence of Latin American cultural studies, subaltern studies, and postcolonial studies. Involves readings and discussions of a representative sample of testimonial literature and criticism.

SPN 175 Human and Nonhuman: Decolonial and Audiovisual Perspectives On Life On A Diminished Planet 4 Seminar, 3 hours; screening, 2 hours; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. A study of decolonial and audiovisual approaches to conceiving the human/nonhuman from Latin American perspectives. Examines issues of extractivism, environmental justice, the debate on living well, the relation between human and nonhuman, and how films illustrate these issues. Cross-listed with MCS 175, and SEHE 143.

SPN 179 Gender, Media, and Latin America 5 Lecture, 3 hours; screening 3 hours; research, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Explores the way Latin Americans have thought of and represented gender across a variety of media including essays, film, novel, short story, and performance. Compares the possibilities and limitations of these media for representing gender in the Latin American context. Cross-listed with MCS 179, LNST 109, and GSST 179.

SPN 180A Survey of Spanish Literature, Middle Ages-1699 4 Lecture, 3 hours; individual study 3 hours. Prerequisite(s): SPN 110. Survey of literary movements and trends and major writers of medieval and Golden Age Spanish literature. Covers writers such as Cervantes, Lope de Vega, Tirso de Molina, Quevedo, and Gngora.

SPN 180B Survey of Spanish Literature, 1700-Present 4 Lecture, 3 hours; extra reading 3 hours. Prerequisite(s): SPN 110. Survey of literary movements and trends and major writers of eighteenth-, nineteenth-, and twentieth-century Spanish literature. Readings in fiction, poetry, drama, and essay. Covers writers such as Moratin, Becquer, Galdos, Larra, Azorin, and Garcia Lorca.

SPN 181A Survey of Spanish American Literature, Discovery to Modernismo 4 Lecture, 3 hours, extra reading 3. Prerequisite(s): SPN 110. Survey of literary movements and trends and major Spanish American writers from the colonial period to Modernismo. Readings are in fiction, poetry, drama, and essay. Covers writers such as Sor Juana Ines de la Cruz, Echeverria, Sarmiento, and Marti.

SPN 181B Survey of Spanish American Literature, Modernismo to the Present 4 Lecture, 3 hours; extra reading 3 hours. Prerequisite(s): SPN 110. Survey of literary movements and trends and major Spanish American writers from Modernismo to the present. Readings are in fiction, poetry, drama, and essay. Covers writers such as Dario, Azuela, Vallejo, Huidobro, Garcia Marquez, Fuentes, Paz, Buenaventura, and Elena Poniatowska.

SPN 185 Imagining the Nation: Film and Media in Latin America 4 Lecture, 3 hours; screening 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Study of the role of media and film in creating a national imaginary in Latin America. Focus is on one region or nation--such as the Andes, the Caribbean, Mexico, Argentina, or Chile--relating local history to the global context. Course is repeatable as topics change to a maximum of 8 units. Cross-listed with MCS 185, and LNST 105.

SPN 187 Latin American Science Fiction 4 Lecture, 3 hours; discussion 1 hour. Prerequisite(s): SPN 110. Focuses on intersections between literature and scientific discourse. Considers how popular notions of science inform the production and reading of the literary text. Topics may include the function of power in scientific discourse, the politics of alternative universes, and science and gender. Course is repeatable as content changes to a maximum of 8 units.

SPN 188 Interdisciplinary Studies: the Hispanic World 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): SPN 110. Includes reading, research, and discussion on particular problems related to Spain and Latin America that lend themselves to interdisciplinary analysis. Course is repeatable as topics change to a maximum of 8 units.

SPN 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): SPN 110; consent of Department Chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable.

SPN 192 Tutorial Activities 2 Activity, 6 hours. Prerequisite(s): SPN 110; senior standing; consent of Department Chair. Under faculty supervision, students conduct discussion sections of elementary Spanish courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

SPN 193 Senior Seminar in the Literatures and Cultures of the Hispanic World 4 Seminar, 3 hours; research, 1 hour; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of senior; or consent of instructor. Introduction to research methods and documentation necessary for completion of a long final project. Specific topics vary depending on the instructor. Intended for Spanish majors. Course is repeatable as content or topic changes to a maximum of 8 units.

SPN 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): SPN 101A, SPN 101B or SPN 109A, SPN 109B; restricted to class level standing of junior, or senior; and consent of instructor. Directed original research. Course is repeatable to a maximum of 8 units.

SPN 199H Senior Honors Research 1 to 5 Course is repeatable.

Graduate Courses

SPN 203 Problems in Spanish Linguistics 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. An introduction to the historical and theoretical evolution of Spanish linguistics as a scholarly discipline. Topics include perennial problems, schools, and history of linguistics. Course is repeatable.

SPN 207 History of the Spanish Language 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 105 or LNST 106, SPN 106, SPN 107 are recommended for Honors Linguistics undergraduate students; graduate standing; or consent of instructor. Covers the development of the Spanish language from its origins to modern times.

SPN 208 Linguistic Approaches to Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Presentation and discussion of semantics, speech acts, and speech genres, and discourse analyses in the framework of contemporary linguistic studies. Topics of inquiry include speech act theory, fiction and nonfiction discourse, pragmatics, syntax, frames of reference, and narrative tenses. Other linguistic levels (i.e., phonology, morphology) are also discussed.

SPN 220 Criticism and Critical Documentation 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Covers strategies of reading and analysis. Topics may include critical approaches such as formalism, new criticism, structuralism, deconstruction, and new historicism; psychoanalysis; gender studies; performance studies; and cultural studies. Also may include practice in Modern Language Association (MLA) documentation. Course is repeatable.

SPN 251 Seminar in the Literature of the Middle Ages and Early Renaissance 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Intensive study of selected topics in Spanish literature through the fifteenth century. Topics may vary. May be repeated for credit.

SPN 257 Seminar in Hispanic Civilization 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Intensive study of special topics in Hispanic civilization. Topics vary. Course is repeatable to a maximum of 12 units.

SPN 258 (E-Z) Genres of Hispanic Literature 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Close reading, analysis, and discussion of the major Hispanic texts, plays, and poems. E. Hispanic Literature And The Art Of Poetry; S. The Satiric Tradition In Hispanic Letters.

SPN 261 (E-Z) Studies in Golden Age Literature 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Intensive study of topics in Spanish literature of the sixteenth and seventeenth centuries. G. The Spanish Comedia; I. Spain And The Western Tradition.

SPN 262 Seminar in Don Quijote 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Critical and theoretical perspectives on Cervantes' masterpiece; assumes prior close reading of the text. Emphasis on narratology and genre, pointing toward a deconstructive/reconstructive reading.

SPN 264 Seminar in Spanish Literature of the Nineteenth-Century 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Study of a genre, movement, or outstanding author of this period. Topics may vary. May be repeated for credit.

SPN 269 (E-Z) Studies in Twentieth-Century Spanish Literature 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Study of authors, movements, or genres from the Generation of '98 to the present. E. Spanish Literature Of The Generation Of ' F. Spanish Poetry: The Avant-garde And The Generation Of ' P. Postwar Spanish Novel (1940 To Present); T. Theatre Of The Postwar And Democratic Epoch (1940-2000). Course is repeatable to a maximum of units.

SPN 270 (E-Z) Latin American Literature 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Study of the main authors and schools in Latin American literature. F. Latin American Film; K. The Mexican Novel; O. The Modern Novel In Colombia; Q. The Postmodern Novel In Latin America (1968-present); T. Latin American Theatre: Sixteenth Through Twentieth Centuries; X. Twentieth-century Spanish American Poetry; Y. The Latin American Avant-garde. Course is repeatable to a maximum of units.

SPN 271 Jorge Luis Borges: the Antinomies of Cosmopolitanism and National Populism 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Studies the poetic and narrative oeuvre of Jorge Luis Borges in relation to theoretical discussions around concepts such as, but not limited to, ideology, materialism, hegemony, populism, and totality. Offers a critical appraisal of Borges' fictions and the theoretical articulation of cultural critique in Latin America. Course is repeatable to a maximum of 8 units.

SPN 272 Seminar in the Literature of A Specific Latin American Country 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. The in-depth study of the most important literary achievements of a single country such as Mexico, Argentina, Chile, or Peru, varying each time the course is offered. May be repeated for credit.

SPN 273A Literature and Culture of Colonial Latin America: the Colonial Period and its Interpreters 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. A panoramic introduction to colonial literature from pre-Columbian times to the eighteenth century. Explores the major texts in their historical and literary contexts. Approaches specific passages from several theoretical perspectives. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SPN 273B Literature and Culture of Colonial Latin America: Spain and the New World 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Examines the interrelationship between key Golden Age and Spanish colonial texts and modern Latin American narrative and essay. Explores issues of literary genealogy, cultural identity, and the reclamation of history. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SPN 273C Literature and Culture of Colonial Latin America: Foundational Narratives of Latin America 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Examines how narrative, history, and the formation of collective consciousness intertwine in Latin America. Considers various periods and their respective mythologies, especially creation myths, with an eye towards teasing out the foundational archetypes and master narratives. Also addresses the purposes of such myths and archetypes. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SPN 274 Aesthetics as Critique: From the Critique of Aesthetics to A Decolonial Perspective 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduction to modern aesthetics in dialogue with decolonial perspectives on aesthetics and art. Emphasis will be given to how aesthetics is always an already political realm where a re-distribution of sense is in dispute. Moves from aesthetics understood as critique to a decolonial critique of aesthetics. Course is repeatable to a maximum of 8 units.

SPN 275 Seminar in Literary Criticism 4 Seminar, 3 hours. Prerequisite(s): graduate standing.

SPN 276 Latin American Corporealities 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Approaches the histories of bodies in Latin America focusing on the general region or a specific country. Uses literature, film, and cultural production to understand history and society as embodied realities. Presents applied philosophy and cultural theory, particularly from Latin America. Topics include women's histories, racialization, gender and sexual diversity. Course is repeatable to a maximum of 8 units.

SPN 277 Poetry and Translation 4 Workshop, 3 hours; extra reading, 1.5 hours; research, 1.5 hours. Prerequisite(s): graduate standing; reading proficiency in Spanish. Discusses the efficacy and difficulty of translating poetry from the Spanish language into English. Explores the works of twentieth- and twenty-first century major Spanish language poets. Provides a forum to render and compare translations. Cross-listed with CWPA 276.

SPN 278 Studies in Latin American Literature and Culture 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores a specific topic in Latin American literary and/or cultural studies. Topics vary. Course is repeatable.

SPN 279 Studies in Spanish Literature and Culture 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores a specific topic in Spanish literary and/or cultural studies. Topics vary. Course is repeatable.

SPN 290 Directed Studies 1 to 6 Prerequisite(s): graduate standing . Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SPN 291 Individual Studies in Coordinated Areas 1 to 6 variable hours. Prerequisite(s): graduate standing. A program of studies designed to advise and assist candidates who are preparing for examinations. Open to M.A. and Ph.D. candidates. Does not count toward the unit requirement for the M.A. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SPN 292 Concurrent Analytical Studies 2 Research, 6 hours. Prerequisite(s): graduate standing; consent of instructor; concurrent enrollment in a SPN 100 course series. Completion of a graduate paper based on research related to the SPN 100 course series. Course is repeatable.

SPN 299 Research For Thesis Or Dissertation 1 to 12 Prerequisite(s): graduate standing. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

SPN 301 Teaching Spanish at the College Level 2 Seminar, 2 hours. Prerequisite(s): graduate standing. Theories of language and language acquisition which underlie modern methods of Spanish language teaching at the college level. Practical experience in grading, test construction, lesson planning, teaching techniques, effective aspects of teaching, and creativity in teaching. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SPN 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 hours. Prerequisite(s): CPLT 301 or equivalent; graduate standing; employment as a teaching assistant or associate in. Supervised teaching in lower-division courses. Required of all teaching assistants in Spanish. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Portuguese

Lower-Division Courses

PORT 090 Special Studies 1 to 3 Prerequisite(s): To be taken with the consent of the Chair of the Department as a means of meeting special curricular problems.

Upper-Division Courses

PORT 101A Intensive Brazilian Portuguese For Speakers of Spanish 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SPN 101A or SPN 109A or equivalent. An introduction to Brazilian Portuguese for students knowing Spanish. Emphasizes comparing and contrasting grammatical constructions. Provides examples from Brazilian literature.

PORT 101B Intensive Brazilian Portuguese For Speakers of Spanish 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): PORT 101A or equivalent. Continuation of PORT 101A. Covers advanced language through conversation, composition, and readings.

PORT 101C Intensive Brazilian Portuguese For Speakers of Spanish 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): PORT 101B or equivalent. Completes the study of structures of oral and written Portuguese, builds vocabulary, and hones the skills necessary to read Brazilian literature, discuss its content and importance, and write short essays explaining its nature.

PORT 162 (E-Z) Survey in Brazilian Fiction 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PORT 101B. Reading and analysis of selected works of major Brazilian prose writers. Topics may vary each time course is offered. E. Jorge Amado And Machado De Assis; F. Graciliano Ramos, Rego, Queiroz, Azevedo, Amado; G. Verissimo, Amado. Course To Be Taught In The Original Language.

PORT 190 Special Studies 1 to 5 variable hours. Prerequisite(s): consent of chair of the department .

Graduate Courses

PORT 201 Brazilian Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. A survey of Brazilian literature from the colonial period to present, including chronicles, poetry, the short story, and the novel. Selected works from the several historical literary periods are read and analyzed. All readings and lectures are done in Portuguese; class discussion and examinations may be done in Portuguese, Spanish, or English.

PORT 202 The Brazilian Novel 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Reading and discussion of selected Brazilian novels from the nineteenth and twentieth centuries, with emphasis on the most important authors (e.g., Joaquin Manuel de Macedo, Alusio Azevedo, Machado de Assis). Reading and lectures are in Portuguese; class discussion is in Portuguese, Spanish, or English.

History

Subject abbreviations: HISA, HISE, HIST
College of Humanities, Arts, and Social Sciences

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Michele R. Salzman, Ph.D.
Kiril Tomoff, Ph.D.
Clifford E. Trafzer, Ph.D. *Rupert Costo Chair in American Indian Affairs*
Fariba Zarinebaf, Ph.D.
Catherine Gudis, Ph.D.

Professors Emeriti

Lynda S. Bell, Ph.D.
James P. Brennan, Ph.D.
Lucille Chia, Ph.D.
Thomas Cogswell, Ph.D.
Carlos E. Cortés, Ph.D.
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Dale V. Kent, Ph.D.
Brian D. Lloyd, Ph.D.
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Roger L. Ransom, Ph.D.
Norman Ravitch, Ph.D.
Mack E. Thompson, Ph.D.
Ronald C. Tobey, Ph.D.
Devra A. Weber, Ph.D.
Charles Wetherell, Ph.D.

Associate Professors

Megan Asaka, Ph.D.
Jonathan P. Eacott, Ph.D.
Charles Denver Graninger, Ph.D.
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Philipp Lehmann, Ph.D.
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Molly McGarry, Ph.D.
Ademide Adelusi-Adeluyi, Ph.D.
Jody A. Benjamin, Ph.D.
Antoine Lentaker, Ph.D.

Assistant Professor

Xiao Chen, Ph.D.
Jorge Leal, Ph.D.
John Marquez, Ph.D.
Natasha McPherson, Ph.D.
Juan Manuel Rubio, Ph.D.

Assistant Professor of Teaching

Kendra Gage, Ph.D.

Visiting Assistant Professor

Benjamin Sullivan, Ph.D.
Yasmina Martin, Ph.D.

Majors

History plays a central role in general education for all undergraduate students. History stresses an understanding of changes that take place in society over time. It also provides a meaning to the past that has many implications for the future. Through the study of history, we can greatly broaden our learning by understanding the experience of others, removed in time and distant in space from our immediate world. The study of history is as useful as it is fascinating. History majors develop an ability to communicate well, both orally and in writing, and the capacity to think clearly and analytically. Whatever one's goals, history is an important component of any degree program.

History/Administrative Studies Major

The History/Administrative Studies major is designed to combine the discipline of History, with its emphasis on changes in society over time, with the study of administrative behavior, the development of public policy, and the tools of decision making. The addition of an Administrative Studies component provides History majors with analytical administrative skills as well as familiarity with the theories and policies of public administration. The concepts of organizational behavior and decision making, when combined with the perspectives provided through the History major, ought to be of particular value to those planning to enter careers in business; federal, state, or local levels of public or private administration; government work or to those planning to attend a professional school of administration or to those utilizing the major in a variety of positions in the public or private sector. (See also the Public History Program, which outlines public sector careers in History.)

History/Law and Society Major

The History/Law and Society major is designed to offer students the opportunity to combine the study of history, with its emphasis on changes over time in society, politics, the economy, and culture, with the study of legal and law-like relationships and institutions. The coherent series of courses included in this major ought to be of particular value to those intending to study law or to enter other graduate fields as well as to those planning professional careers in government, public administration, business, or other areas where the relationship between history and the law is of significance.

Career Opportunities

A major in history prepares students for a broad range of general careers in public history, museums, archives, business, education, government work, and foreign affairs that ask for written and verbal skills developed in the major. History is an excellent preparation for graduate study in this field as well as professional schools such as law, library, and business administration.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The History Department offers the B.A. degree in History, History/Administrative Studies, and History/Law and Society. The course offerings in the Department of History are designed to bring about an understanding of the forces that have shaped people and societies across time and space. A student electing major in History will receive a broad education that debelops analytical skills and fosters a critical understanding of ourselves and our world through the study of the past – both the "deep past" and the more recent past.

Students seeking deeper engagement in reserach may choose the 'With Distinction' option described below.

Change of Major

Students switching to the History Major must have completed two History courses with a grade of "C" or better. Students switching to the History/Administrative Studies, or the History/Law and Society Major must have completed three History courses with a grade of "C" or better. Advanced Placement units earned can be applied towards one course when determining major change eligibility.

History Major

The B.A. degree in History requires satisfactory completion of 52 units as follows:

1. **Lower-division requirements (20 units):**
   a) one world history course (4 units)
   b) HIST 99W (with at least a grade of "C") (4 units)
   c) Three lower division elective courses in History (12 units).
2. **Upper-division requirements (24 units):**
   a) Six upper-division elective courses in History (24 units). Among all the various courses selected there must be at least one course in areas beyond the United States or Europe, one course in areas within the United States or Europe, and one course temporally rooted before 1800.
   b) Students are encouraged to include one HIST 197 Research for Undergraduate seminar (4 units) in their courses for the upper-division requirement, in addition to the seminar requirement below.
3. **Seminar Requirement (8 units):**
   a) Eight (8) units from the following seminar courses: HIST 001 (Historian as Detective,) HIST 197 (Research for Undergraduates), HIST 195A/B (Senior Thesis), and HIST 199/199H (taken in connection with a HIST 197 seminar).
   b) In choosing HIST 197 seminars, students should select sections whose theme pertains to upper-division courses they have already taken.

Students who wish to be recognized as completing the B.A. degree with distinction normally complete HIST 195A and HIST 195B,

the two-quarter Senior Thesis. Majors who complete HIST 197 followed by a connected HIST 199 or 199H, or who complete HNPG 195 and whose senior thesis is accepted by the University Honors Program are also eligible. The B.A. degree with distinction also requires a minimum 3.5 GPA in the major at the time of graduation.

Lower-division courses taken elsewhere may be counted toward the lower-division requirement; up to four advanced placement units earned in high school may count toward its fulfillment as well. Students may petition to apply up to two relevant upper-division courses (8 units) from other UCR departments towards the upper-division elective requirement. Please consult with the academic advisors for further details.

History/Administrative Studies Major

The major requirements for the B.A. degree in History/Administrative Studies are as follows:

History requirements (52 units):

All requirements for the B.A. in History

Administrative Studies requirements (37 units)

1. Lower-division courses (17 units)
   a) BUS 010, BUS 020
   b) STAT 008 or equivalent (may be used to satisfy breadth requirements)
   c) CS 008 (may be used to satisfy breadth requirements)
2. Upper-division requirements (20 units)
   a) Two courses (8 units) from the list below:
      (1) ECON 102 or ECON 103 or ECON 104A or ECON130 or ECON 162/BUS 162
      (2) PSYC 140 or PSYC 142
      (3) SOC 150 or SOC 151
      (4) POSC 181 or POSC 182E or POSC 182G or POSC 183 or POSC 186
      (5) ANTH 127 or ANTH 127S or ANTH 131

      These two courses must be outside the discipline of History and cannot be courses included as part of the three-course Business Administration track or their cross-listed equivalents.

   b) A three-course track (12 units) in Business Administration courses from one of the following:
      (1) **Organizations (General):** BUS 100W, BUS 107, BUS 158/ANTH 105, BUS 176/SOC 176, SOC 150, SOC 151
      (2) **Human Resources Management/ Labor Relations:** BUS 100W, BUS 107, BUS 121, BUS 144, BUS 145, BUS 153/ ECON 153, BUS 155, BUS 156, BUS 157, PSYC 142
      (3) **Business and Society:** BUS 100W, BUS 102, BUS 107, PHIL 116, POSC 182E or POSC 182G, POSC 186
      (4) **Marketing:** BUS 103, and two from BUS 111, BUS 112, BUS 113, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119, BUS 124, BUS 126, BUS 151, BUS 152, BUS 159, BUS 164, BUS 182
      (5) **Managerial Accounting/Taxation:** BUS 108, and two from BUS 166, BUS 168A, BUS 168B
      (6) **Financial Accounting:** BUS 108, BUS 165A, BUS 165B, BUS 165C, BUS 167
      (7) **Finance:** BUS 106/ECON 134 and two from BUS 131, BUS 132, BUS 134, BUS 135, BUS 136, BUS 137, BUS 138, BUS 139 BUS 140E, BUS 141, BUS 147
      (8) **Management Information Systems:** BUS 101, BUS 110, BUS 125, BUS 128 BUS 171, BUS 172, BUS 173, BUS 174, BUS 175, BUS 179
      (9) **Production Management:** BUS 104/ STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

Note

In filling the dual requirements of the selected major, students may not count more than two courses toward both parts of their total requirements (History requirements and Administrative Studies requirements).

History/Law and Society Major

The Law and Society major is open to undergraduate students with junior standing who have completed LWSO 100 with a grade of "C" or higher. The major requirements for the

B.A. degree in History/Law and Society are as follows:

1. **History requirements** (52 units): All requirements for the B.A. in History
2. **Law and Society requirements** (36 units)
   a) PHIL 007 or PHIL 007H
   b) LWSO 100 (with a grade of "C" or better)
   c) One course chosen from POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
   d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
   e) Two courses chosen from HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180
   f) LWSO 193, Senior Seminar

Note

For sections 2.d) and 2.e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (History requirements and Law and Society requirements). The History courses that may fill the dual requirements include HISE 153 (History of the Common Law), and HISA 120A and HISA 120B (The Supreme Court and the Constitution).

Minor

The History Department also offers a minor in History. The History minor requires satisfactory completion of 28 units as follows.

1. 1. At least one World History course (4 units) and at least one other lower-division course (4 units).
2. At least four upper-division courses (16 units) in History. The department recommends that minors address the diversity of human historical experiences by including courses in at least two historical fields, regions, or eras.
3. One additional History course (4 units).

Lower-division courses taken elsewhere may be counted toward the lower-division requirement; up to four advanced placement units earned in high school may count toward its fulfillment as well. Please consult with the academic advisors for further details.

Students undertaking a minor in History are urged to consult with the academic advisors for quarterly advising and meet with the undergraduate advisor at least once a year. Appointments can be made through the academic advisors.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Recommended Prelaw Courses

The History major has long been considered as an ideal major for students planning to study law since it meets the three goals that law schools recommend for undergraduate applicants:

1. That they achieve an understanding of the development of social, political, and economic institutions
2. That they develop an ability to communicate well, both orally and in writing
3. That they possess the capacity to think clearly and analytically.

The History Department especially recommends the following upper-division courses to prelaw students:

HISE 150 (Ancient/Medieval England)

HISE 153 (History of the Common Law)

HISA 120A, HISA 120B (The Supreme Court and the Constitution)

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Graduate Program

The Department of History offers the M.A. and the Ph.D. in History. Students may choose a concentration in Public History in conjunction with the M.A. in History or as a field for the Ph.D. in History.

Admission

The department accepts admissions applications from students intending to earn each of these degrees. Applicants must have either the B .A. in History or the baccalaureate in another field

and be able to demonstrate a satisfactory knowledge of history. Applications for admission to the graduate programs in History are normally accepted for the fall quarter only. Applicants must submit a writing sample. Students entering the Ph.D. program without an M.A. may also earn the M.A. in History, as described below. Students admitted to the M.A. program may later request admission to the Ph.D. program.

Entering students choose a faculty advisor, who works closely with the graduate advisor in approving the student's course of study.

Detailed rules for each program are contained in the departmental protocols.

Master's Degree

The Department of History offers two courses of study: History and Public History. Students in the History program have the option of completing the degree via Thesis (Plan I) or Comprehensive Exam (Plan II). Students in Public History must complete the thesis.

Students seeking the M.A. degree choose a field of specialization from the list below, and follow one of two plans:

Areas of Specialization (and related courses)

1. United States (HIST 201A, 201B, 201C, 265AB, 272AB,273AB, 274AB, 275AB, 276AB)
2. Native American (HIST203A, 203B, 203C, 237, 276AB, 265AB, 272AB, 273AB, 274AB, 275AB)
3. Ancient Mediterranean (HIST211, 221, 222, 223, 225AB, 251AB, Tri-Campus Classics or seminars in related departments with approval from Graduate Advisor)
4. European, with concentration in either Early Modern Europe, Modern Europe, Britain, or Russia (HIST 200, 204, 205A, 205B, 209A, 209B, 224, 240E, 240F, 251AB, 253AB, 255AB, 256AB, 258AB)
5. Latin American (HIST 206A, 206B, 285AB, 251AB)
6. Southeast Asia (HIST 242 or courses in related departments with approval from Graduate Advisor. 243AB, 251AB)

Plan I (Thesis) Candidates must complete 40 units of required course work beyond the baccalaureate, 36 of which must be at the graduate level. The student's curriculum must include the following:

1. At least one reading seminar or an equivalent course in the student's area of specialization (Reading seminars include HIST 201A, 201B, 201C, 203A, 203B, 203C, 237, 200, 204, 205A, 205B, 209A, 209B, 206B, 211, 221, 222, 223, 224, 240E, 240F, 242, 250, 254 or courses in related departments with approval from Graduate Advisor)
2. At least one two-quarter research seminar, preferably in the student's area of specialization (Two-quarter research seminars include HIST 265AB, 272AB, 273AB, 274AB, 275AB, 251AB, 253AB, 255AB, 256AB, 258AB, 285AB, 225AB, 243AB or courses in related departments with approval from the Graduate Advisor.
3. At least 4 units in courses outside the student's area of specialization
4. Twelve (12) units of thesis preparation, HIST 299

Students prepare a substantial M.A. thesis. Candidates must pass an oral examination discussing the thesis and future research agenda. The thesis and orals committee consists of three faculty members.

Oral Examination Modality
The oral exam can be taken in one of the following modes: In-Person, Hybrid, or Remote. In In-Person mode all committee members and the student are physically present; in Hybrid mode some committee members/student are in-person and some committee members/student are remote, and in Remote mode all committee members and the student attend remotely. The student and their advisor will discuss which mode best suits the circumstances and communicate that decision to the Graduate Student Affairs Officer well before the exam. If Hybrid is chosen, those in person are expected to be present on campus in a video and audio enabled room that supports members physically present and those participating remotely.

Plan II (Comprehensive Examination)
Candidates must complete 40 units of required course work beyond the baccalaureate, 32 of which must be at the graduate level. The curriculum must include the following:

1. At least one reading seminar or an equivalent course in the student's area of specialization (Reading seminars include HIST201A, 201B, 201C, 203A, 203B, 203C, 237, 200, 204, 205A, 205B, 209A, 209B, 206B, 211, 221, 222, 223, 224, 240E, 240F, 242, 250, 254 or courses in related departments with approval from Graduate Advisor)
2. At least one two-quarter research seminar, preferably in the student's area of specialization (Two-quarter research seminars include HIST 265AB, 272AB, 273AB, 274AB, 275AB, 251AB, 253AB, 255AB, 256AB, 258AB, 285AB, 225AB, 243AB or courses in related departments with approval from the Graduate Advisor)
3. At least 16 units in courses outside the student's area of specialization.

Candidates prepare a portfolio selected by the student and advisor, and must pass a comprehensive oral examination based on the submitted material. The examination committee consists of two faculty members.

Oral Examination Modality
The comprehensive oral exam can be taken in one of the following modes: In-Person, Hybrid, or Remote. In In-Person mode all committee members and the student are physically present; in Hybrid mode some committee members/student are in-person and some committee members/student are remote, and in Remote mode all committee members and the student attend remotely. The student and their advisor will discuss which mode best suits the circumstances and communicate that decision to the Graduate Student Affairs Officer well before the exam. If Hybrid is chosen, those in person are expected to be present on campus in a video and audio enabled room that supports members physically present and those participating remotely.

Language Requirement
Candidates must demonstrate an ability to read one foreign language.

Professional Development Requirement
All M.A. students must complete HIST 301. This course does not count toward unit requirements.

Normative Time to Degree
6 quarters. M.A. students who wish to transfer to the Ph.D. program must apply for a sixth-quarter review as described in the Ph.D. program. No student may enroll in these M.A. programs for more than 9 quarters.

Public History Master's Program

This program provides historical training in academic research and historiography as well as preparation for careers outside of the academy, in archives, historic preservation, museums, oral history and other realms of public engagement with the humanities, including the digital.

Students prepare in two areas:

1. A historical field outside of Public History
2. Public History

Course Work
Candidates must complete a minimum of 40 units of courses as follows:

1. One two-quarter graduate history research seminar. (Two-quarter research seminars include HIST 265AB, 272AB, 273AB, 274AB, 275AB, 251AB, 253AB, 255AB, 256AB, 258AB, 285AB, 225AB, 243AB or courses in related departments with approval from the Graduate Advisor)
2. Two graduate reading seminars in the historical field (selected from Areas of Specialization listed above, Reading seminars include HIST 201A, 201B, 201C, 203A, 203B, 203C, 237, 200, 204, 205A, 205B, 209A, 209B, 206B, 211, 221, 222, 223,224, 240E, 240F, 242 250,254 or courses in related departments with approval from Graduate Advisor)
3. At least one of the following: HIST 238, 260, 262, 263, 298G or additional courses with approval of the Public History advisor.
4. At least one practicum from HIST 260L, 262L, 263L, 238L or additional courses approved by the Public History advisor.
5. Four upper-division undergraduate or graduate courses related to Public History. Two should be outside the History department; courses outside the department require approval of the Public History advisor.
6. Four units of thesis preparation HIST299.

All students must also complete HIST 398-I, which does not count toward the 40-unit requirement.

Internship
The candidate must complete a ten-week internship, coincident with an academic quarter or summer session, at a cooperating institution, for training under professional supervision in a field of the candidate's choice. The internship is registered with a History Department faculty advisor as HIST 398-I. The internship culminates in work toward the M.A. thesis.

M.A. Thesis and Oral Examination
Students prepare a substantial M.A. thesis. Candidates must pass a two-part oral examination: one part on the M.A. thesis and a second part on the candidate's field of history and Public History.

Oral Examination Modality
The oral exam can be taken in one of the following modes: In-Person, Hybrid, or Remote. In In-Person mode all committee members and the student are physically present; in Hybrid mode some committee members/student are in-person and some committee members/student are remote, and in Remote mode all committee members and the student attend remotely. The student and their advisor will discuss which mode best suits the circumstances and communicate that decision to the Graduate Student Affairs Officer well before the exam. If Hybrid is chosen, those in person are expected to be present on campus in a video and audio enabled room that supports members physically present and those participating remotely.

Professional Development Requirement
All M.A. students must complete HIST 301. This course does not count toward unit requirements.

Normative Time to Degree
6 quarters. M.A. students who wish to transfer to the Ph.D. program must apply for a sixth-quarter review as described in the Ph.D. program. No student may enroll in these M.A. programs for more than 9 quarters.

Doctoral Degree

The Department of History offers the Ph.D. in History. The Ph.D. program in History prepares graduates for careers as university teachers, public historians, and professional researchers and analysts.

Admission
Students may prepare for entry into the Ph.D. program by earning a B.A. or an M.A. degree in History or by earning a degree in a closely related field that involves significant study of history. Students holding a degree in another field are evaluated by the graduate studies committee on a case-by-case basis to determine the level of the graduate program at which they should commence their studies.

Ph.D. Fields
Students prepare three fields: a research field, a complementary field, and a teaching field. The research fields that the department offers are listed below; complementary and teaching fields may be chosen from among the research fields or from the list of additional fields. In special cases, students may petition to replace the complementary field with a custom field designed by the student in consultation with two faculty members who agree to administer the written examination in the field. Students may not offer three fields that all deal with a single country or region.

Course Work
Candidates for the Ph.D. degree entering with a baccalaureate degree complete a minimum of 56 units of required course work, 44 of which must be at the graduate level. Students who enter with an M.A. degree complete a minimum of 28 units, 20 of which must be at the graduate level, and may be able to waive certain course requirements listed below. The student's curriculum during the entire graduate career must include the following:

1. At least two two-quarter graduate research seminars (Two-quarter research seminars include HIST 225AB, 243AB, 251AB, 253AB, 255AB, 258AB, 265AB, 272AB, 273AB, 274AB, 275AB, 285AB, or courses in related departments with approval from the Graduate Advisor). One two-quarter research seminar may be waived by petition for students completing a MA in Public History at UCR.
2. At least six reading seminars or equivalent courses, chosen from the student's fields (Reading seminars include HIST 200, 201A, 201B, 201C, 202A, 202B, 203A, 203B, 203C, 204, 205A, 205B, 206A, 206B, 207, 209A, 209B, 210, 211, 212, 213, 214, 215E-G, 215I-L, 216E-F, 217E, 218, 220, 221, 222, 223, 224, 226E-G, 226I-K, 226M-O, 226Q, 229, 230, 237, 238, 240E-F, 241, 242, 250, 254, 260, 262, 263, 264, 277, 278, 290 or courses in related departments with approval from the Graduate Advisor).
3. At least three courses approved by the graduate advisor for the teaching field requirement, of which two must be at the graduate level

Courses should be chosen in consultation with the student's faculty advisor and the graduate advisor; suitable courses are described in the departmental protocols. HIST 290 may be used towards the specific requirements above only with the permission of the graduate advisor.

Professional Development Requirement
All Ph.D. students must complete HIST 301. This course does not count toward unit requirements.

Research Fields:
Early America
Nineteenth-Century United States
Twentieth-Century United States
American West
Native American History
Ancient Mediterranean
Early Modern Europe
Modern Europe
Early Modern England
Modern England
Modern Russia
Colonial Latin America
Modern Latin America
Southeast Asia
Public History

Additional Fields
Early Modern World History
Modern World History
Gender History

Sixth-Quarter Review
All Ph.D. students undergo a comprehensive review no later than the sixth quarter of enrollment in the program, based on a portfolio selected by the student and advisor. The graduate studies committee reviews the student's record and makes one of the following recommendations: proceed, hold, or terminate. Students receiving a hold may reapply once, within three quarters. Students receiving a terminate may continue enrolling for no more than three quarters to complete M.A. requirements.

Only under extraordinary circumstances may a student continue enrolling for more than 9 quarters (including enrollment while an M.A. student at UCR) without permission to proceed to examinations.

M.A. in History degree for Ph.D. Students

Students enrolled in the Ph.D. program may apply for the M.A. degree in History once they have completed the requirements for the degree.

Requirements for completing the Ph.D. degree

Examinations
Students are examined in their research and complementary fields by a single written examination and at the Ph.D. oral examination. To take the Ph.D. oral qualifying examination, the student must submit a preliminary draft of the dissertation proposal. The teaching field is satisfied by course work.

Oral Qualifying Exam Modality
The oral qualifying exam can be taken in one of the following modes: In-Person, Hybrid, or Remote. In In-Person mode all committee members and the student are physically present; in Hybrid mode some committee members/student are in-person and some committee members/student are remote, and in Remote mode all committee members and the student attend remotely. The student and their advisor will discuss which mode best suits the circumstances and communicate that decision to the Graduate Student Affairs Officer well before the exam. If Hybrid is chosen, those in person are expected to be present on campus in a video and audio enabled room that supports members physically present and those participating remotely.

Language Requirement
Students must demonstrate reading proficiency in at least one language other than English. In certain research fields, students may be required to demonstrate a higher level of proficiency or to demonstrate proficiency in additional languages. Consult the departmental protocols for specific requirements.

Candidacy
Students advance to candidacy after completing all examinations, course requirements, and the language requirement. By the end of the following academic quarter, each student must submit to the graduate study committee a dissertation proposal approved by the student's faculty advisor.

Dissertation
Candidates must submit a dissertation that demonstrates scholarly, original, and independent investigation of a subject in the student's research field chosen with the advice and approval of the dissertation committee.

Normative Time to Degree
17 quarters (including M.A. work).

Lower-Division Courses

The History Department offers these lower-division courses for the benefit of the entire campus, not specifically for History majors. HIST 010, HIST 015, HIST 017A, HIST 017B, and HIST 020 are appropriate preparation for upper-division work in the department.

HIST 001 The Historian as Detective 4 Seminar, 3 hours; extra reading, 2 hours; term paper, 1 hour. Introduces close reading of the primary sources and secondary literature that historians use to reach conclusions about the past. Provides an opportunity to work creatively with historical materials and become the historian as detective.

HIST 004 Introduction to Chicano History 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers the historical heritage of the Chicano from Spanish and Indian origins to the Chicano movement. Emphasizes the period since 1845. Cross-listed with ETST 004.

HIST 010 World History: Prehistory to 1500 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces early human societies from a global perspective. Covers the emergence of urban societies, diverging political and social orders, and global connections from the Neolithic to 1500 CE. Themes include technologies and ecology, governance and conflict, social and cultural identities, religious and ideological movements, and developing patterns of interregional contact. Credit is awarded for one of the following HIST 010, HIST 010H, or HIST 010W.

HIST 010H Honors World History: Prehistory to 1500 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors. Honors course corresponding to HIST 010. Introduces early human societies from a global perspective. Covers the emergence of urban societies, diverging political and social orders, and global connections from the Neolithic to 1500 CE. Themes include technologies and ecology, governance and conflict, social and cultural identities, religious and ideological movements, and developing patterns of interregional contact. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for one of the following HIST 010H, HIST 010, or HIST 010W.

HIST 010W World History: Prehistory to 1500 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ENGL 001B with a grade of C or better. Introduces early human societies from a global perspective. Covers the emergence of urban societies, diverging political and social orders, and global connections from the Neolithic to 1500 CE. Themes include technologies and ecology, governance and conflict, social and cultural identities, religious and ideological movements, and developing patterns of interregional contact. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to English 001C. Credit is awarded for one of the following HIST 010W, HIST 010, or HIST 010H.

HIST 015 World History: 1500 to 1900 4 Lecture, 3 hours; discussion, 1 hour. A critical analysis of globalization after 1500CE as it shaped the modern world. Students investigate agrarian societies, industrialization, and environmental challenges; conquest, colonialism, and imperialism; enslavement and migrations; resistance and survival under colonial systems; religious, economic, and political revolutions; the development of science and medicine; and changes in everyday life. Credit is awarded for one of the following HIST 015 or HIST 015H.

HIST 015H Honors World History: 1500 to 1900 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors. Honors course corresponding to HIST 015. A critical analysis of globalization after 1500CE as it shaped the modern world. Students investigate agrarian societies, industrialization, and environmental challenges; conquest, colonialism, and imperialism; enslavement and migrations; resistance and survival under colonial systems; religious, economic, and political revolutions; the development of science and medicine; and changes in everyday life. Credit is awarded for one of the following HIST 015H or HIST 015.

HIST 017A Introduction to United States History 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the major themes and issues in the history of the United States from colonialization to the middle of the nineteenth century.

HIST 017B Introduction to United States History 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the major themes and issues in the history of the United States from the middle of the nineteenth century to the present.

HIST 020 World History: the Long Twentieth-Century 4 Lecture, 3 hours; discussion, 1 hour. A critical analysis of global historical changes in the twentieth century, and how they shape the world we live in today. Students explore popular revolutions, World Wars and the Cold War, social & cultural change, capitalism, imperialism & decolonization; environmental crises; technological innovation and other contemporary global developments. Credit is awarded for one of the following HIST 020, HIST 020H, or HIST 020W.

HIST 020H Honors World History: the Long Twentieth-Century 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors. Honors course corresponding to HIST 020. A critical analysis of global historical changes in the twentieth century, and how they shape the world we live in today. Students explore popular revolutions, World Wars and the Cold War, social & cultural change, capitalism, imperialism & decolonization; environmental crises; technological innovation and other contemporary global developments. Credit is awarded for one of the following HIST 020H, HIST 020, or HIST 020W.

HIST 020W World History: the Long Twentieth Century 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in WRIT 040N; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. A critical analysis of global historical changes in the twentieth century and how they shape today's world. Explores popular revolutions; World Wars and the Cold War; social and cultural change; capitalism, imperialism, and decolonization; environmental crises; technological innovation; and other contemporary global developments. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to WRIT 030. Credit is awarded for one of the following HIST 020W, HIST 020, or HIST 020H.

HIST 025 The Ancient Mediterranean 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): none. Surveys the political history of the ancient Mediterranean world from the Bronze Age (3000 B.C.) to the beginning of the Common era. Focuses on the Near East (Sumer, Babylonia, Assyria, Egypt, Israel, Persia), Greece, and Rome. Provides a coherent background for advanced study in ancient Near Eastern, biblical, or classical history.

HIST 027 Rome: the Ancient City 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Traces the development of the city of ancient Rome. Studies the literary and historical evidence alongside the physical remains of the city including its monuments, art, and historical and archaeological remains. Seeks to introduce the Romans and their importance for later ages. Cross-listed with AHS 030, and CLA 017.

HIST 030 Themes and Personalities in History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Explores enduring themes and great personalities in history selected from Western and non-Western traditions. Concentrates on particular subtopics to be announced in the Schedule of Classes. Course is repeatable as content or topic changes to a maximum of 24 units.

HIST 033 Witchcraft in Colonial America 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces the history of witchcraft beliefs and witch-hunting in colonial America. Explores witchcraft in its many dimensions: religious, cultural, psychological, political, legal, social, and economic. Students read original documents and study recent scholarly interpretations of early American events and attitudes.

HIST 034 Introduction to Native American Culture and Religion 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Interdisciplinary study of contemporary and historic Native American efforts to resist colonialism, with a strong emphasis on land matters, identity issues, and religious forms. Promotes critical reflection on historic and contemporary culture and politics. Cross-listed

with RLST 024.

HIST 035 History of North American Indians, 1491-1799 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines North American Indian history from 1491 through Handsome Lake's Revitalization Movement, highlighting the experiences of selected Native groups during the colonial era. Special attention is given to the importance of Native American perspectives of historical issues and events.

HIST 036 History of North American Indians, 1800-1899 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines North American Indian history during the nineteenth century from Jefferson's administration to McKinley's administration. Explores government policies, native agency, and the interface of multiple cultures. Emphasizes Native American historical interpretations.

HIST 037 History of North American Indians, 1900-Present 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines North American Indian history during the twentieth century and early twenty-first century. Topics include allotment, the Indian New Deal, World War II, termination, self-determination, and tribal sovereignty. Students read original documents, study new interpretations, and learn about contemporary Native people.

HIST 039 Introduction to Asian American History 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces the history of Asian Americans from the mid-nineteenth century to the present. Explores the migrations and lives of East, South, and Southeast Asian Americans within local, national, and global contexts. Major themes include imperialism, labor, race and racism, citizenship, and resistance.

HIST 040 Literary Response to Disaster and Repression 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An examination of how literature (e.g., memoir, fiction, and poetry) can be utilized in the recovery from disaster or repression. Analyzes examples from Asia, Africa, and Europe to address the issues of looking squarely, coming to terms, commemoration, and apology. Cross-listed with CPLT 040. Credit is awarded for one of the following HIST 040, CPLT 040, or CPLT 040W.

HIST 041 The History of Media, Old and New 4 Lecture, 3 hours; extra reading, 1.5 hours; individual study, 1 hour; written work, 0.5 hours. Prerequisite(s): none. .An historical overview of the technologies and institutions which have sustained the production and transmission of knowledge from antiquity to the present. Themes include literacy and its consequences, the book, manuscript production, the printing press, mass media, the computer, and the Internet. Explores literate traditions from across the world. Credit is awarded for only one of HIST 041 or HIST 030 with subtitle: HIST: INFORMTION/COMMUNIC TECH"

HIST 042 Medical Racism, Eugenics and the Tuskegee Study of Untreated Syphilis 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Grapples with the history of racism, eugenics, and medicine in twentieth-century United States through close study of the Tuskegee Study of Untreated Syphilis (1932-1972.) Examines medical racism and healthcare activism before, during, and after the Tuskegee Study.

HIST 044 Gods, Ghosts, and Grandparents 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to the rich diversity of Chinese beliefs and practices concerning gods, ghosts, and ancestors through primary and secondary sources. Includes oracle bone inscriptions, philosophical arguments on the existence of spirits, tomb contracts, sutra promoting the goddess Guanyin as Giver of Sons, ghost stories, and eyewitness accounts of funeral rituals. Cross-listed with RLST 044.

HIST 045 (E-Z) Topics in Asian History 4 Lecture, 3 hours; consultation, 1 hour. An introduction to regional histories and cultures of Asia. E. Premodern China And Japan; F. Contemporary China; G. India In The Western Imagination. Cross-listed with AST 045 (E-Z).

HIST 046 Introduction to Southeast Asian History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Introduces major themes and events in Southeast Asian history. Covers from prehistory to contemporary events in the region. Develops basic historical approaches to understanding contemporary trends, such as the spread of world religions, regional differences and connections, trading patterns, cultural forms, and historically important sites.

HIST 047 Dragons and Dynasties: Themes in Imperial Chinese History 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Surveys selected topics in Chinese history (ancient times through the eighteenth century). Introduces basic concepts and facts on China's geography, religions and philosophies, relationship between state and society, socioeconomic roles of women, foreign relations, and science and technology.

HIST 048 From Yam Sauce to Golden Arches: Chinese Food History 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A basic introduction to different roles of food in Chinese history. Topics include regional food cultures, religion, rituals, festivals; food as medicine; food production and land use. Considers the impact of introducing new kinds of food into Chinese society; food as social and cultural markers, and famines. Credit is awarded for only one of AST 188E/HIST 188E or HIST 048.

HIST 051 Europe From Plague to Revolution, 1400-1750 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. A survey of European history from the aftermath of the Black Death until the French Revolution. Introduces the geographic, demographic, and economic conditions underlying early modern European society, and examines cultural, political, and intellectual forms as they changed. Special attention is given to the historical experience of individuals, including commoners and elites.

HIST 052 Europe From the Enlightenment to 1968 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A survey of European history from the mid-eighteenth century to 1968. Focuses on the political and social revolutions in France and Russia, two world wars, and the consequences of rapid industrialization. Explains the emergence of a large middle class, the transformation of women's roles, and changing perceptions of the outside world.

HIST 060 Years of Protest: America, 1960-1975 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. A close examination of the intellectual and cultural trends in the period from 1960-1975, with emphasis on the rise of the New Left, the Counterculture and the growing militancy of Blacks, Native Americans, Chicanos, and women.

HIST 075 Introduction to Latin America 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to 500 years of Latin American history using popular stories and myths to explore source documentation and historical evidence. Analysis of the multiple versions of truth that can constitute the history and collective consciousness of a people. Source material includes written texts, film, and music.

HIST 088 Digital Storytelling: Mapping City Life 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): none. Introduces the use of digital storytelling platforms that employ mapping and timelines to analyze primary and secondary sources, as well as to develop and present narratives about the past. Focuses on nineteenth- and twentieth-century cities, addressing themes that include race, gender, labor, migration, sex work, and slavery.

HIST 089 Maps: A History of Cartography 4 Lecture, 3 hours; extra reading, 3 hours. Introduces the history of cartography. Explores the importance of maps as tools that shape our understanding of the world and as useful sources about the past.

HIST 099W The Historian's Workshop 4 Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): concurrent enrollment in WRIT 040O; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; or consent of instructor. An introduction to the tools in the historian's workshop. Includes historical sources, methods of analysis, and various approaches to historical narrative. Discusses historical research, analysis, and writing through study of historical works and through practice with original historical sources. Prepares for upper-division History and humanities courses. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits as alternatives to WRIT 030.

Upper-Division Courses

HIST 103 History of Science From Antiquity to Copernicus 4 Lecture, 3 hours; research, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to ancient and medieval science focusing on the development of mathematical description of nature in astronomy. Covers the early histories of physics and mechanics as they relate to the history of astronomy.

HIST 104 Scientific Revolution, 1500-1700 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Analyzes cultural exchanges between the Islamic world and Latin West, especially in mathematical science. Explores knowledge practices involved in European empire and exploration, the transforming conceptions of the cosmos, and the physical and natural worlds in the Early Modern period.

HIST 105 History of Science, 1700-1900 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Analyzes the emergence of modern scientific disciplines including thermodynamics, geology, paleontology, and electricity and magnetism. Also explores the Darwinian worldview and its social consequences; the role of science in colonization and racial domination; and the romantic rejection of science.

HIST 106 Science in the 20th Century 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines a century in which science and power were inextricably bound together. Analyzes revolutions in physics and biology; scientific racism and eugenics; and the role of scientists in world wars, the Cold War, the global atomic age, and climate change.

HIST 107 Disease and Society 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Covers a world history of disease and how it relates to cultural shocks, environmental change, and survival. Evaluates the complex and reciprocal relationship between illness and society, and the historical dynamics around power, race, gender, and class which define disease and shape life chances, medicine and health. Cross-listed with SEHE 173.

HIST 108 Technology in the Premodern World 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Survey of technological developments in ancient and early-modern Japan, China, India, the Middle East, Africa, Central and South America, and Europe. Focuses on key mechanical and civil technologies and the role of the state in their development. Cross-listed with ENGR 108.

HIST 109 Technology in Modern Europe and America, 1700-Present 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the emergence of modern Europe through the first and second industrial revolutions in Europe and America. Explores the development of device commodities as the typical form of consumer technology in the nineteenth and twentieth centuries, as well as addresses philosophical issues in understanding technology. Cross-listed with ENGR 109.

HIST 110 History of Ancient Astronomy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the origins and history of ancient astronomy from Mesopotamia to the Greco-Roman world. Topics include the problems of the calendar and planetary motion, and the relation between astronomy and astrology in the ancient world. Focuses on readings from primary texts. Cross-listed with CPAC 134.

HIST 111 Public History and Community Voices 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the study of public history and the use of oral history, narratives, written sources, photographs, material culture, and other documentary evidence important to presenting historical information and interpretation to a large audience. Analysis of archives, museums, government agencies, familial sources, and other historical repositories that hold community voices. Students present public history by producing an exhibit, published work, or community project.

HIST 121 Middle Eastern History, 1200 to 1800 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Explores the history of the Middle East from 1200 to 1800. Includes the Mongol conquests as well as the rise and expansion of the Ottoman empire.

HIST 122 Modern Middle East History (1800-1935) 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the history of the modern Middle East from 1800 to the aftermath of WWI. Examines rise of colonial empires, imperial rivalries and clashes in the borderlands, and movements of autonomy.

HIST 124 Women in Middle Eastern and Islamic History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Explores the history of women in the Middle East from the medieval to the modern period. Focuses on the legal status of women, their social and economic position, the rise and development of the feminist movement, and the impact of various Islamist movements.

HIST 125 Islam and Revolution in Iran 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the historical background to the Iranian revolution of 1978-1979. Offers a critical assessment of the existing scholarship. Includes the rise of Shi'ism as Iranís state religion; the relationship between religion, state, and society; and the role of Shi'i Islam versus other ideologies with social movements.

HIST 126 Istanbul in History and Fiction 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores urbanization in Middle Eastern and Ottoman history. Includes the history of Istanbul from the Ottoman conquest to the end of that empire. Addresses questions of urban transformation, imperial cities, Islamization, urban institutions, cosmopolitanism, and modernity.

HIST 127 Israel: the Jewish State 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines Zionism and the state of Israel in the period from the first Zionist Congress in 1896 to the present. Addresses religious, social, economic, and political aspects of the Jewish state. Cross-listed with RLST 126.

HIST 128 Iran Through Literature and Cinema 4 Lecture, 3 hours; extra reading, 1 hour; screening, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores the history of Iran through its rich literary and film production. Examines the transformation of the country and its revolutionary age through the humanities, arts, and contributions to global cinema.

HIST 130A History of Christianity: Origins to the Reformation 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Surveys the history of Christianity from its origins through the Reformation. Includes the development of Christian beliefs, practices, and institutions in historical contexts. Cross-listed with RLST 135A.

HIST 130B History of Christianity: Modern Era 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Surveys the history of Christianity since 1500. Emphasizes the Christianization of Asia, Africa, and the Americas in the long colonial era. Follows developments in Christian belief, practice, and institutions up to the present. Topics include Reformation, mission, colonialism, empire, conversion, syncretism, modernity, Vatican II, and the rise of evangelical Christianity. Cross-listed with RLST 135B.

HIST 137 (E-Z) Themes and Topics in African History 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A thematic and topical approach to the study of African history from the early Nile Valley civilizations to the twentieth century. Examines the temporal and spatial development of African societies--including their social, political, economic, and ideological systems--during the precolonial, colonial, and postcolonial periods. F. West African History To 1800; I. Nineteenth- And Twentieth-century

Africa And European Imperialism; J. Ancient Africa; K. Africa From 1000-1880; M. Twentieth-century Africa. Cross-listed with ETST 117 (E-Z).

HIST 138 African Cities in Modern History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A history of African cities from 1800 to the present. Examines the range of settlement patterns in Africa's changing landscape. Also explores connections between urban and social change, gender, culture, architecture, colonialism, and the effects of rural-urban migration.

HIST 139 African: Fiction, Film and Science Fiction 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of the instructor. Introduces the use of fiction, film and science fiction in the study of African history. Examines themes including gender, colonialism, sexuality, nationalism, urbanization and disease cultures.

HIST 140 Africa and the French Atlantic 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of the instructor. Introduces historical debates about French Atlantic expansion from the 17th century through the final French abolition of slavery in 1848 with a special focus on Africa. Explores distinctions between French and other European (especially British) imperial trajectories.

HIST 179 Introduction to Modern Japanese History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical examination of key moments in the history of Japan from the Tokugawa period through the late twentieth century.

HIST 180 Early Traditional China 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; at least one lower-division history course recommended. The history of China from Neolithic times to the end of the Tang Dynasty (early tenth century, C.E.) with emphasis on social, economic, and political history.

HIST 181 Early Modern China 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Surveys the history of China from the Mongol conquest in the 14th century to the High Qing in the 18th century. Topics include governance, the civil service examination system, kinship, gender, religion, trade, ethnicity, and borderlands. No prior knowledge of Chinese history or Chinese language is required.

HIST 182 Modern China 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. HIST 180 and HIST 181 are recommended. Examines the history of China from the Opium War to the early Communist period (1842-1960). The emphasis is on reaction to the Western impact and modernization.

HIST 184 The Vietnam Wars 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to Vietnamese history in the twentieth century. Covers the three Indochina wars (1945-1986) from different Vietnamese perspectives. Topics include experiences during French colonial rule; the anticolonial movements; periods of French and American military involvement up to 1975; the postwar society; and the post-doi moi society. Cross-listed with AST 160, SEAS 184, and VNM 184.

HIST 185 Southeast Asia, Prehistory to 1800 4 Lecture, 3 hours; extra reading, 3. Prerequisite(s): upper-division standing or consent of instructor. Covers the major Southeast Asian historical periods and cultures. Includes prehistory, classical kingdoms, and early modern trading states. Considers the role of ancient stories, religious systems, technologies, and art forms in forming traditional Southeast Asian identities, as well as the influences on these identities from outside the region. Cross-listed with AST 126, and SEAS 185.

HIST 186 Modern Southeast Asia, 1800 to Present 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the formation of modern Southeast Asian nations and cultures since 1800. Compares colonial and postcolonial experiences in the region. Studies the formation of nationalist movements and the relationship of nationalist history with traditional and local histories. Considers the role of the individual, modern media, and global trade in the near-present. Cross-listed with AST 129, and SEAS 186.

HIST 187 Vietnamese Literary History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. A historical analysis of Vietnamese literature from its oral tradition to contemporary fiction. Follows the formation of the nation-state and the subsequent struggles with the Chinese, French, Japanese, and Americans. No knowledge of Vietnamese required. Readings are in translation or bilingual editions. Classes are conducted in English. Cross-listed with AST 162, VNM 162, and SEAS 162.

HIST 188 (E-Z) Topics in Chinese History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): HIST 180 or HIST 181 or HIST 182; restricted to class level standing of junior, or senior. An in-depth look at important topics in Chinese history. E. Chinese Food Culture; F. Four Great Inventions Of Imperial China; G. Environmental History Of China. Cross-listed with AST 188 (E-Z).

HIST 189 Encountering Vietnam 5 Lecture, 6 hours; tutorial, 6 hours; activity, 6 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Focuses on literary and historical accounts of Vietnam. Utilizes translated travel writings from different genres and eras. Proficiency in Vietnamese not required. Taught in Vietnam and offered only in summer. Offered in Summer only. Cross-listed with AST 189.

HIST 190 Special Studies 1 to 5 Prerequisite(s): To be taken with the consent of the chair of the department to meet special curricular problems. Course is repeatable to a maximum of 16 units.

HIST 191 (E-Z) Seminar in History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Requires a substantial research paper or project, the result of carefully guided independent work. E. Medieval History; F. Renaissance And Reformation; G. Seventeenth- And Eighteenth-century Europe; I. Nineteenth-century Europe; J. Nineteenth- And Twentieth-century England; K. Twentieth-century Europe; L. Modern Russia; M. European Thought And Culture; N. Mexican Migration To The United States; P. Colonial American History; Q. Nineteenth-century American History; R. The American West; S. Twentieth-century American History; T. American Thought And Culture; U. Colonial And Nineteenth-century Latin America; V. Recent Latin America; W. Chinese History; X. Mass Media; Y. African History; Z. Ancient History.

HIST 195A Senior Thesis 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): HIST 197; or consent of instructor. Original research and senior thesis writing under close faculty supervision. Includes formulating an individual research question, evaluating competing narratives in both primary and secondary sources, and developing an original argument based on primary and secondary sources. Graded in Progress (IP) until HIST 195A and HIST 195B are completed, at which time a final grade is assigned. After completing both HIST 195A and HIST 195B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Course is repeatable to a maximum of 8 units.

HIST 195B Senior Thesis 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): HIST 195A. Completion of a senior thesis under close faculty supervision. After completing both HIST 195A and HIST 195B, may repeat the sequence once for credit. Course is repeatable to a maximum of 8 units.

HIST 197 Research For Undergraduates 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): HIST 099W; restricted to class level standing of junior, or senior; restricted to major(s) History, History/Administrative Studies, History/Law and Society; or consent of instructor. Introduces advanced historical research on specific topics using primary and secondary source materials. Analyzes historical questions related to the selected topics and develops historical arguments to be explored further. Topics vary based upon the research focus of the instructor. Course is repeatable as content or topic changes to a maximum of 16 units.

HIST 198 R'course: Variable Topics 1 Activity hours vary per R'Course proposal. Prerequisite(s): permission needed from department; sophomore standing or better. An opportunity for UCR undergraduate students to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original

course topics are variable and unique from other departmental course offerings, designed to highlight the student facilitators' expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 8 units.

HIST 198G Public History Practicum 1 to 12 Seminar, 1 to 2 hours; research, 1 to 6 hours; internship, 3 to 24 hours. Prerequisite(s): restricted to class level standing of junior, or senior; and consent of instructor. Provides practical experience and project-based research in public history. Work with public history faculty or an appropriate professional organization to gain skills related to museum exhibitions, interpretive historic sites, archives and libraries, oral and digital history projects, historic preservation, and other forms of public history. Course is repeatable to a maximum of 16 units.

HIST 198I Individual Internship in History 1 to 12 Seminar, 1 to 2 hours; research, 1 to 6 hours; internship, 3 to 24 hours; term paper, 1 to 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; and consent of instructor. Presents the policies and operations (present and past) of cooperating agencies such as museums, archives, professional associations, clinics, hospitals, churches, and businesses. Includes becoming familiar with the ongoing operations of these organizations as well as researching and writing their histories under faculty supervision. Course is repeatable as content or topic changes to a maximum of 16 units.

HIST 199 Senior Research 1 to 4 Research, 3 to 12 hours. Prerequisite(s): a segment of HIST 197; not open to students in the University Honors Program. The student works individually with the instructor to continue and expand a research paper or project begun in a HIST 197. Course is repeatable to a maximum of 8 units.

HIST 199H Senior Honors Research 1 to 5 Research, 3 to 15 hours. Prerequisite(s): admission to University Honors or consent of instructor. Offers the opportunity for directed research at an honors level. Satisfactory (S) or No Credit (NC) grading is not available.

Graduate Courses

Consent of the instructor is required for enrollment in all graduate courses.

HIST 200 Reading Seminar in European History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces advanced study of major themes and areas in British, European, and Russian history. Concentrates on recent scholarship illustrating current methods and questions in European history. Covers all three major geographical areas, although emphasis may vary. Course is repeatable to a maximum of 8 units.

HIST 201A Reading Seminar in American History: Colonial North America 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores colonial North American history as presented by primary and secondary sources. Course is repeatable to a maximum of 12 units.

HIST 201B Reading Seminar in American History: United States, 1789-1877 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores American history from 1789 to 1877 as presented by primary and secondary sources. Course is repeatable to a maximum of 12 units.

HIST 201C Reading Seminar in American History: United States, 1877 to the Present 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores American history from 1877 to the present as presented by primary and secondary sources. Course is repeatable to a maximum of 12 units.

HIST 202A Reading Seminar in European History: Early Modern Europe (1400-1789) 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores European history from 1400 to 1789 as presented through primary and secondary sources. Course is repeatable to a maximum of 12 units.

HIST 202B Reading Seminar in European History: 1789-Present 4 Lecture, 3 hours; extra reading, 3 hours., Prerequisite(s): graduate standing or consent of instructor. Explores European history from 1789 to the present as presented through primary and secondary sources. Course is repeatable to a maximum of 12 units..

HIST 203A Reading Seminar in Native American History: Early America, Fifteenth- Through Eighteenth-Centuries 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the theoretical approaches, central historical problems, and historiographical debates related to the study of Native American history. Covers the fifteenth through the eighteenth centuries. Course is repeatable to a maximum of 12 units.

HIST 203B Reading Seminar in Native American History: Nineteenth-Century 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the theoretical approaches, central historical problems, and historiographical debates related to the study of nineteenth-century Native American history. Course is repeatable to a maximum of 12 units.

HIST 203C Reading Seminar in Native American History: Twentieth-Century 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the theoretical approaches, central historical problems, and historiographical debates related to the study of twentieth-century Native American history. Course is repeatable to a maximum of 12 units.

HIST 204 Materials For Modern French and Latin European History 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides readings in secondary literature on the history of France since the 1789 revolution. Also explores selected themes related to the histories of Italy and Spain. Course is repeatable to a maximum of 12 units.

HIST 205A Reading Seminar in English History: 1485-1820 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An examination of selected primary materials related to English history. Also includes assessment of secondary accounts. Course is repeatable to a maximum of 12 units.

HIST 205B Reading Seminar in English History: 1760 to the Present 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An examination of selected primary materials related to English history. Also includes assessment of secondary accounts. Course is repeatable to a maximum of 12 units.

HIST 206A Reading Seminar in Latin American History: Colonial Period to 1820 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores colonial Latin American history as presented by primary and secondary sources. Course is repeatable to a maximum of 12 units.

HIST 206B Reading Seminar in Latin American History: 1820 to the Present 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores Latin American history from 1820 to the present as presented by primary and secondary sources. Course is repeatable to a maximum of 12 units.

HIST 207 Reading Seminar in the Modern World 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Explores the major concepts, categories, methodological approaches, and historiography in recent scholarship on the modern world (circa 1800 to the present). Focuses on interregional and interdisciplinary analysis. Course is repeatable to a maximum of 12 units.

HIST 209A Reading Seminar in Modern Russia: 1801 to 1917 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Examines the historiography of Russian history. Topics include social development, cultural and religious history, peasants, industrialization, revolutionary movements, Bolshevism, ideology, and the Russian Civil War. Course is repeatable to a maximum of 12 units.

HIST 209B Reading Seminar in Modern Russia: Soviet History 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Examines the historiography of Russian history. Topics include social development, cultural and religious history, Stalinism, World War II, and the post-Stalinist period. Course is repeatable

to a maximum of 12 units.

HIST 210 Introduction to Economic History 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Analysis of selected problems on economic history with an emphasis on methodological approaches to those issues.

HIST 211 Reading Seminar in the Roman Empire 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the theories and practices of recent research into key issues of the history of Rome. Covers the late Republic and continues into the high empire. Introduces the key historiographic texts as well as the primary ancient sources relevant to key topics in Roman history. Course is repeatable to a maximum of 12 units.

HIST 212 Greek Historical Texts 2 Seminar, 1 hour; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Reading and translation of Greek historical texts. Authors treated vary by quarter. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 20 units.

HIST 213 Latin Historical Texts 2 Seminar, 1 hour; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Reading and translation of Latin historical texts. Authors treated vary by quarter. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 20 units.

HIST 214 Reading Seminar in Archaic and Classical Greek History 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Explores the major concepts, categories, methodological approaches, and historiographical issues in recent scholarship on the Archaic and Classical Greek world (circa 1200-300 BCE). Focuses on interregional and interdisciplinary analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 12 units.

HIST 215 (E-Z) Topics in American History 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Analysis of selected specific topics in American history. E. Slave Folklore And The Historical Process; F. Culture And Politics In Twentieth-century United States; G. Transnational Migrations; I. Populism, The Progressive Movement, And The New Deal; J. The World Of <i>little Women; K. Hist Of Wkrs & Wrkrs Org In Us; L. History Of Slavery And Race In The United States.

HIST 216 (E-Z) Themes in the History of the Americas 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing. Addresses intranational and international histories of the countries and peoples of the Americas. E. Mexican Cross-border Labor, Organizing, And Internationalism, 1900-1975; F. Borders And Borderlands.

HIST 217 (E-Z) Topics in Asian History 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. An introduction to a set of major research monographs in Asian history. E. Agrarian China Frm Ming To Prs.

HIST 218 Africa in the Era of the Transatlantic Slave Trade 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the political economies and the social and cultural histories of Atlantic Africa between 1500 and 1800 within the wider framework of the Atlantic world. Emphasis is on methodological and theoretical issues and questions. Readings are based on primary historical sources as well as on recent research in the field.

HIST 220 Reading Seminar in Women's History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An exploration of the major methodological and historiographical issues in women's history. Focuses primarily but not exclusively on women in the United States.

HIST 221 Reading Seminar in Hellenistic History 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces the Hellenistic age as it took shape in the Eastern and Western Mediterranean. Examines how new currents of thought merged with preexisting institutions. Topics include political, social, religious, and intellectual developments. Course is repeatable to a maximum of 12 units.

HIST 222 Reading Seminar in Late Antiquity 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the central historiographical debates in the field of Late Antiquity. Course is repeatable to a maximum of 12 units.

HIST 223 Reading Seminar in Early Medieval History 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces advanced scholarship in selected areas of early medieval historiography. Focuses on independent historiographical research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

HIST 224 Research Seminar in Later Medieval History 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces advanced scholarship in selected areas of later medieval historiography. Focuses on independent historiographical research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

HIST 225A Research Seminar in Ancient and Medieval History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines a historical theme or issue in ancient and medieval history. Includes readings in primary sources and analysis of research methods. First of a two-quarter sequence in which work begins on a major research paper. After completing both HIST 225A and HIST 225B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 225B Research Seminar in Ancient and Medieval History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 225A. Examines a historical theme or issue in ancient and medieval history. Includes readings in primary sources and analysis of research methods. Second of a two-quarter sequence in which a major research paper is completed. After completing both HIST 225A and HIST 225B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 226 (E-Z) Special Topics in Latin American History 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): HIST 206A or HIST 206B; graduate standing. Analysis of selected specific topics in Latin American History. E. Latin American Social And Economic History; F. Race And Ethnicity In Latin America; G. Women In Latin America; I. Politics And The Formation Of Nation States; J. History Of The Latin American Family; K. Immigration, Emigration, And Migration; M. Mass Media In Latin America; N. U.s.-latin American Relations; O. Nationalism, Liberalism, And Socialism In Latin America: The Southern Cone, 1880-1980; Q. Slavery And Slave Society In Nineteenth-century Latin America.

HIST 229 The American Other: Apparitions and Appropriations 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Cultural studies of the uncanny in American history in relation to race, gender, and colonialism.

HIST 230 The American Frontier: Ideas and Interpretations 4 Lecture, 3 hours; consultation and extra reading, 3 hours. Prerequisite(s): HISA 137. The broad themes and historical interpretations regarding the frontier as a factor in the American character and in American institutions.

HIST 237 Reading Seminar in Native American Historical Theory 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An examination of salient theoretical issues raised by Native American history. Critiques theoretical approaches and assumptions currently shaping Native American history and assays the potential contributions to Native American history of theoretical approaches developed in other fields of concentration.

HIST 238 Reading Seminar in Oral History 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the field of oral history. Explores the theoretical foundations, ethical issues, and new directions in oral history research.

HIST 238L Oral History Practicum 4 Lecture, 2 hours; research, 6 hours. Prerequisite(s): graduate standing or consent of instructor. A study of oral history methods, theory, and practice. Students conduct interviews,

transcribe, and produce a paper which utilizes the oral history interviews. Includes discussion of final interviews, transcripts, analysis, and the paper. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 8 units.

HIST 240 (E-Z) Reading Seminar in Documentary Source Practices 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduction to the scholarly handling of texts including inscriptions, manuscripts, archival documents, and electronic material. Instruction in methodologies, tools, sources, and the editing and use of texts in history. Analyzes archival structure and organization, textual authorship, provenance, paleography, language, internal structure, and variants. E. Russian; F. Early Modern Europe; Z. Ottoman & Persian Historical Texts And Archives. Course is repeatable to a maximum of 12 units.

HIST 241 Reading Seminar in Asian History 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores major concepts, categories, methodological approaches, and historiographical issues in the study of a region or country in Asia. Course is repeatable to a maximum of 36 units.

HIST 242 Approaches to Southeast Asian History 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to central historical problems, historiographical debates, materials, and theoretical approaches in Southeast Asian history. Readings each week focus on a different theme. Course is repeatable to a maximum of 8 units. Cross-listed with SEAS 204.

HIST 243A Research Seminar in Southeast Asian History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Discusses Southeast Asian topics from regional, comparative, and local perspectives. May be taken as a one- or two-quarter course (HIST 243A/SEAS 243A, HIST 243B/SEAS 243B). After completing both HIST 243A/SEAS 243A and HIST 243B/SEAS 243B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Cross-listed with SEAS 243A.

HIST 243B Research Seminar in Southeast Asian History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 243A/SEAS 243A. Discusses Southeast Asian topics from regional, comparative, and local perspectives. Students produce a substantial research paper that continues their work from HIST 243A/SEAS 243A. May be taken as a one- or two-quarter course (HIST 243A/SEAS 243A, HIST 243B/SEAS 243B). After completing both HIST 243A/SEAS 243A and HIST 243B/SEAS 243B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Cross-listed with SEAS 243B.

HIST 250 New Directions in Historical Research 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Frontiers of research in major historical periods. Explores emerging theories and innovative methods and considers their relevance to the future of the discipline. Discusses the methods and kinds of research which are most fruitful in the assigned instructor's particular specialty. Course is repeatable as topics change to a maximum of 12 units.

HIST 251A General Research Seminar in History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A general research seminar in history including European, continental European, British, Russian, ancient, and Latin American history. Includes a major research paper based on extensive use of primary source material. Graded In Progress (IP) until HIST 251A and HIST 251B are completed, at which time a final grade is assigned. After completing both HIST 251A and HIST 251B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 251B General Research Seminar in History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): HIST 251A ; graduate standing or consent of instructor. A general research seminar in history including European, continental European, British, Russian, ancient, and Latin American history. Includes readings in archival and research methods. Also includes a major research paper based on extensive use of primary source material. After completing both HIST 251A and HIST 251B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 252 Materials Supplement 4 Seminar, 3 hours. Prerequisite(s): any course in 201-206 series. Designed as a supplement to program of readings covered in materials courses; additional works are to be drawn from reading lists for M.A. comprehensive examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

HIST 253A Research Seminar in Renaissance and Reformation History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers primary and secondary literature related to Renaissance and Reformation history. First of a two-quarter sequence in which students begin work on a research paper. After completing both HIST 253A and HIST 253B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 253B Research Seminar in Renaissance and Reformation History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 253A. Second of a two-quarter sequence in which students complete a research paper on Renaissance and Reformation history. After completing both HIST 253A and HIST 253B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 254 Reading Seminar in Historical Theory and Methods 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; consent of instructor; consent of advisor if repeating the course. Studies the evolution of the discipline of history by exploring theories, philosophies, and methods that are used in historical explanation. Concentrates on how some particular body of theory has influenced the writing of history. Course is repeatable to a maximum of 12 units as topics change.

HIST 255A Research Seminar in Modern Russia 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): UC Riverside graduate standing; consent of one instructor. A research seminar on modern Russian history (1801 to present). Covers appropriate primary sources and secondary literature. Topics include but are not limited to social history, labor, ideology, politics, and revolutions from the Imperial and/or Soviet periods. An intercampus course taught jointly by faculty from UC Riverside, Irvine, San Diego, and Los Angeles. After completing both HIST 255A and HIST 255B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 255B Research Seminar in Modern Russia 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): UC Riverside graduate standing; consent of one instructor; HIST 255A. A research seminar on modern Russian history (1801 to present). Covers completion of research paper begun in HIST 255A. Topics include but are not limited to social history, labor, ideology, politics, and revolutions from the Imperial and/or Soviet periods. An intercampus course taught jointly by faculty from UC Riverside, Irvine, San Diego, and Los Angeles. After completing both HIST 255A and HIST 255B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 256A Research Seminar in English History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; HISE 151, HISE 152 or equivalents. A seminar on seventeenth- and eighteenth-century English history emphasizing on the historical literature within the field. Covers appropriate primary sources and secondary literature. After completing both HIST 256A and HIST 256B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 256B Research Seminar in English History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; HISE 151, HISE 152 or equivalents; HIST 256A. A seminar on seventeenth- and eighteenth-century English history emphasizing the historical literature within the field. Includes completion of a research paper. After completing both HIST 256A and HIST 256B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 258A Seminar in Modern European History 4 Seminar, 3 hours. Prerequisite(s):graduate standing. Graded In Progress (IP) until HIST 258B is completed, at which time a final grade is assigned. Course is

repeatable to a maximum of 8 units.

HIST 258B Seminar in Modern European History 4 Seminar, 3 hours. Prerequisite(s): graduate standing. Course is repeatable to a maximum of 8 units.

HIST 260 Historic Preservation 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the history, theories, and practices of historic preservation and place-based interpretations of the past. Explores the role of history and memory in the construction of the built and natural environment as well as the socioeconomic, cultural, and political dynamics of preservation.

HIST 260L Preservation Conservation Practicum 4 Seminar, 2 hours; research, 6 hours. Prerequisite(s): HIST 260. Offers hands-on experience in the practice of historic preservation, conservation, and place-based interpretations of the past.

HIST 262 Museum Studies 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A graduate-level introduction to the history of museums and the field of museum studies. Explores new directions in the theory and practice of museum work and public history.

HIST 262L Museum Studies Practicum 4 Seminar, 2 hours; research, 6 hours. Prerequisite(s): concurrent enrollment in HIST 262. Supervised research and interpretation in a museum setting. Course is repeatable to a maximum of 8 units.

HIST 263 Archival Management 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Theory and practice of archival management; history of archives; professional ethics. See the History department for grading statement.

HIST 263L Archival Management Practicum 3 Research, 3 hours. Prerequisite(s): HIST 263. Supervised research and administrative experience in an archive; intended to follow HIST 263.

HIST 264 Reading Seminar in Public History 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces primary materials for public history and its central historical problems and historiography. Also discusses debates within the field. Course is repeatable to a maximum of 12 units.

HIST 265A Research Seminar in Public History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on themes affecting the management of archives, museums, cultural resources, and historic preservation. Studies sources and documents and presents findings through an original research paper or museum, archival, or preservation project. First of a two-quarter sequence. Graded In Progress (IP) until HIST 265A and HIST 265B are completed, at which time a final grade is assigned. After completing both HIST 265A and HIST 265B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 265B Research Seminar in Public History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on themes affecting the management of archives, museums, cultural resources, and historic preservation. Studies sources and documents and presents findings through an original research paper or museum, archival, or preservation project. Second of a two-quarter sequence. After completing both HIST 265A and HIST 265B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 272A Seminar in American Colonial and Early National History 4 Seminar, 3 hours. Prerequisite(s): graduate standing. Graded In Progress (IP) until all terms are completed, when a final grade will be assigned. Course is repeatable to a maximum of 8 units.

HIST 272B Seminar in American Colonial and Early National History 4 Seminar, 3 hours. Prerequisite(s): graduate standing. Course is repeatable to a maximum of 8 units.

HIST 273A Research Seminar in the American West 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A research seminar focusing on themes in the study of the American West from the colonial era to the present. Explores migration, expansion, and modern urban development. Includes historical interpretations, readings, discussions, and research. Graded In Progress (IP) until HIST 273A and HIST 273B are completed, at which time a final grade is assigned. Students begin a paper based on archival research, oral history, and material culture. After completing both HIST 273A and HIST 273B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 273B Research Seminar in the American West 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 273A. A research seminar focusing on themes in the study of the American West from the colonial era to the present. Explores migration, expansion, and modern urban development. Includes historical interpretations, readings, discussions, and research. Students complete a paper based on archival research, oral history, and material culture. After completing both HIST 273A and HIST 273B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 274A Seminar in Nineteenth-Century United States History 4 Seminar, 3 hours. Prerequisite(s): graduate standing. Graded In Progress (IP) until HIST 274A and HIST 274B are completed, at which time a final grade is assigned. Course is repeatable to a maximum of 8 units.

HIST 274B Seminar in Nineteenth-Century United States History 4 Seminar, 3 hours. Prerequisite(s): graduate standing. Course is repeatable to a maximum of 8 units.

HIST 275A Seminar in Twentieth-Century United States History 4 Seminar, 3 hours. Prerequisite(s): graduate standing. Graded In Progress (IP) until HIST 275A and HIST 275B are completed, at which time a final grade is assigned. Course is repeatable to a maximum of 8 units.

HIST 275B Seminar in Twentieth-Century United States History 4 Seminar, 3 hours. Prerequisite(s): graduate standing. Course is repeatable to a maximum of 8 units.

HIST 276A Research Seminar in Native American History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An examination of Native American historical research. Explores philosophy, methodology, historiography, and sources relative to American Indians. Students study a variety of sources and documents, compile an annotated bibliography, conceptualize and design a research project, and begin work on an original historical paper. Graded In Progress (IP) until HIST 276A and HIST 276B are completed, at which time a final grade is assigned. After completing both HIST 276A and HIST 276B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 276B Research Seminar in Native American History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 276A. A continuation of HIST 276A. Students conduct research on the topics selected in HIST 276A. Additional readings may be assigned at the discretion of the instructor. At the term's end, students present their findings through an original historical research paper. Instructors may also assign oral presentations of research findings. After completing both HIST 276A and HIST 276B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 277 Reading Seminar in Early Modern World History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Study of selected historical themes such as labor, gender, migration, cultural contact, and colonial systems in an early modern context. Focuses on regional studies and issues of global connection in the early modern period. Intensive discussions of current scholarship in the given field. Course is repeatable to a maximum of 12 units with consent of advisor.

HIST 278 Early Modern Empires in Eurasia 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Explores the history of early modern empires in the Middle East (the Ottomans and Safavids) in a comparative format. Focuses on such issues as Islam and conquest, state formation, confessional empires and toleration, commerce, and culture. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable. Cross-

listed with MEIS 278.

HIST 285A Seminar in Latin American History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Graded In Progress (IP) until both terms are completed, when a final letter grade will be assigned. Course is repeatable to a maximum of 8 units.

HIST 285B Seminar in Latin American History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Course is repeatable to a maximum of 8 units.

HIST 287A Research Seminar in Nature, Place, and Space: Environmental and Spatial Approaches to History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys historical literature and methodologies involved in spatial and environmental analyses of the past. Examines technical and methodological issues involved in using spatial documents (maps). Discusses applications of historical research to environmental remediation. Includes work on a research paper. May be taken as a one- or two-quarter course (HIST 287A, HIST 287B). After completing both HIST 287A and HIST 287B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 287B Research Seminar in Nature, Place, and Space: Environmental and Spatial Approaches to History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 287A. Surveys historical literature and methodologies involved in spatial and environmental analyses of the past. Examines technical and methodological issues involved in using spatial documents (maps). Discusses applications of historical research to environmental remediation. Students discuss and critique each other's research. After completing both HIST 287A and HIST 287B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Course is repeatable to a maximum of 8 units.

HIST 290 Directed Studies 1 to 6 Prerequisite(s): consent of the chair of the department. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

HIST 291 Individual Study in History 1 to 12 Prerequisite(s): graduate standing. A program of study designed to advise and assist graduate candidates who are preparing for examinations. Does not count toward the unit requirement for the master's degree. Graded Satisfactory (S) or No Credit (NC).

HIST 292 Concurrent Analytical Studies 1 to 4 Research, 3 to 12 hours. Prerequisite(s): consent of instructor. Taken concurrently with some 100-series course, but on an individual basis. Devoted to completion of a graduate paper based on research or criticism related to the 100-series course, the program of study is worked out with the instructor. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

HIST 297 Directed Research 1 to 6 Prerequisite(s): consent of instructor. Individualized graduate student research under the sponsorship of specific faculty members, in topics other than the student's dissertation. Graded Satisfactory (S) or No Credit (NC). May be repeated for up to 8 units.

HIST 298G Public History Group Internship 1 to 12 Seminar, 2 hours; term paper, 1 to 6 hours; research, 1 to 6 hours; internship, 3 to 18 hours. Prerequisite(s): graduate standing or consent of instructor. Provides practical experience and project-based research in public history. Work with public history faculty or appropriate professional organization to gain skills related to the following areas: museum exhibitions, interpreting historic sites, archives and libraries, oral and digital history projects, historic preservation, and other forms of public history. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 16 units.

HIST 299 Research For Thesis Or Dissertation 1 to 12 Prerequisite(s): graduate standing. Research for thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

HIST 301 The Teaching of History at the College Level 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing. Normally required of all doctoral candidates and teaching assistants in the department; open to terminal M.A. students with consent of instructor. Credit not applicable to graduate unit requirements. Graded Satisfactory (S) or No Credit (NC).

HIST 302 Teaching Practicum 1 to 4 Seminar, 1 hour; clinic, 1 to 4 hours. Prerequisite(s): limited to departmental teaching assistants; graduate standing Supervised teaching in upper- and lower-division history courses. Required of all History teaching assistants. Fulfills teaching portion of Ph.D. teaching requirement. Graded Satisfactory (S) or No Credit (NC).

HIST 398I Internship in Public History 8 to 12 Research, 8 to 12 hours; internship, 16 to 24 hours. Prerequisite(s): consent of program coordinator. An internship at a museum, archive, gallery, or other cooperating institution under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC).

HIST 402 Professional Practice For the Public Historian 2 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. Case study approach to the practice, professional codes, and ethics of public historians, including problems in conflict of interest, fee services, political advocacy, expert legal testimony, civil service, conflict with other professions (e.g., architecture), bidding procedures, and proprietary rights.

History of the Americas

Upper-Division Courses

HISA 110A Colonial America 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An exploration of early American society from settlement through the mid-eighteenth century. Topics include the convergence of Native American, European, and African cultures; the origins of slavery; religious diversity; and the growth and development of the colonies.

HISA 110B Revolutionary America 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis of the political, social, and cultural movements that led to the American revolution and the formation of the Republic. Topics include crowd activity, imperial conflict, and the creation of the constitution.

HISA 110C The Early Republic: the United States, 1789-1848 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes social, economic, political, and intellectual forces that transformed the United States from a fledgling preindustrial nation into a sprawling, exuberant, capitalist society. Topics include industrialism, capitalism, Christianity, democratic politics, slavery and racial structures, abolitionism, and American radicalism and nationalism.

HISA 113 Slavery and the Old South 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An investigation of slavery in the antebellum South. Topics include: the emergence of the self-conscious South, the romanticized plantation, American historians and slavery, etc.

HISA 114 The American Civil War 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis of the American Civil War. Topics include slavery as a cause of the war as well as the impact of emancipation and of the war on both North and South. Credit is awarded for only one of HISA 114 or HISA 114S.

HISA 114S The American Civil War 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis of the American Civil War. Topics include slavery as a cause of the war and the impact of emancipation and of the war on both North and South. Credit is awarded for only one of HISA 114 or HISA 114S.

HISA 115 Reconstruction 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Major leaders and events of post-Civil War America, with emphasis upon Reconstruction, racial and political conflict, industrial growth, and other historical developments that helped shape the modern South and the expanding nation.

HISA 116 The United States, 1877-1914 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis of political, social, economic, and cultural developments in the United States between the end of Reconstruction and the beginning of World War I.

HISA 117A United States, 1914 to 1945 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics include the emergence of the United States as a global power, the second industrial revolution, the development of a consumer culture, and the creation of a regulatory state.

HISA 117B United States, 1945 to the Present 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics include the Cold War, the political and cultural consequences of post-World War II affluence, the social movements of the 1960s, Vietnam, and the conservative resurgence of the 1970s and 1980s.

HISA 119 Modern U.s. Consumer Culture 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the history of mass consumer culture in the United States. Includes the shift from mass production to mass consumption; the grown in advertising and marketing; relationships of race and gender to the market; impacts on built and natural environment; rise of logistics; and waste. Cross-listed with SEHE 144. Credit is awarded for one of the following HISA 119, SEHE 144, HISA 119S, or SEHE 144S.

HISA 119S Modern U.s. Consumer Culture 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the history of mass consumer culture in the United States. Includes the shift from mass production to mass consumption; the grown in advertising and marketing; relationships of race and gender to the market; impacts on built and natural environment; rise of logistics; and waste. Cross-listed with SEHE 144S. Credit is awarded for one of the following HISA 119S, SEHE 144S, HISA 119, or SEHE 144.

HISA 120A The Supreme Court and the Constitution 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the intellectual and political sources of the Constitution in English, colonial, and revolutionary war history; the Philadelphia convention and the debate over ratification; the formative impact of the Marshall court; and the crisis over slavery and the nature of the Union. Discusses the role of the court in protecting U.S. capitalism and then examines the court's role in legitimizing the New Deal by 1953. The main materials of the course are the actual opinions of the court.

HISA 120B The Supreme Court and the Constitution 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines constitutional history concerning the powers of the national government. Explores the court's focus on the struggle over racial and gender equality and on the expansion and protection of individual liberties contained in the Bill of Rights.

HISA 122A Religious Cultures in Early America 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; HIST 017A is recommended. An introduction to religious beliefs and practices during the seventeenth and eighteenth centuries in the colonies that became the United States. Cross-listed with RLST 137A.

HISA 122B Religious Cultures in Modern America 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; HIST 017B is recommended. An introduction to a variety of religious traditions, movements, and cultures from 1800 to the present in the United States. Cross-listed with RLST 137B.

HISA 123 American Economic History 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H. Examines the economic history of the United States with an emphasis on the incentives and events surrounding the colonization of modern day United States, the American Revolution, economic growth and expansion throughout the 1800's, the American civil war, and other major historical events leading up to the present. Cross-listed with ECON 123.

HISA 124 Labor and Working Class History of the United States 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the history of work, workers and their families, communities, organizations, unions, and workers' organizations in the United States from the mid-nineteenth century to the present. Attention is paid to gender, race, immigration, and diversity of the work force, and role of government, within an economic and international context.

HISA 125 (E-Z) Topics in American Society and Culture 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Focused studies in American social and cultural history. Employs close study of a specific theme from a transnational perspective. E. United States In Global 1960s; F. Ethics&society In Early Americ; G. United States&the Philippines; I. Cultr&poltcs On Sn Francsco Ba.

HISA 126 Family Histories and American Culture 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores experiences of family and kinship in the nineteenth-century United States, especially in the context of Indian removal, racial slavery, and settler imperialism. Readings include family history, memoir, and historical monographs. Provides context for recent developments in genealogical research as they relate to American family history.

HISA 127 The United States and the World 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent from instructor. Examines the role of the United States in global affairs through specific historical themes and topics. Topics may include expansion and intervention in the 19th and 20th centuries; America as an economic, cultural, and diplomatic influence; U.S. immigration policies and patterns; and the influence of foreign nations and peoples. Course is repeatable as topics change to a maximum of 8 units.

HISA 128 American Nature Writing, Thoreau - Present 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): Restricted to class level standing of junior, or senior; or consent of instructor. Investigates a broad range of ideas about nature and the place of humans in the natural world through a survey of novels, poetry, essays, and polemics written by Americans since the mid-19th century. Topics include conservation, ecology, environmental activism, and the sanctity of the natural world.

HISA 132 United States Women, Gender, and Sexuality: 1620-1850 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Covers topics in early American women's lives (e.g., work, politics, and sexuality) while charting the developments of gendered systems in the United States. Topics may include masculinity, the rise of the middle class, and the private-public dichotomy.

HISA 133 Women, Gender, and Sexuality in United States History: 1850-Present 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduces the major themes in the history of U.S. women and gender issues. Draws upon recent work in the field to explore the relationships between gendered meanings of politics and the politics of gender in the late nineteenth and twentieth centuries in the United States.

HISA 134 Black Feminist Theory and Activism 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Considers the writings and collective organizational strategies of African American women intellectuals and activists developed in response to the ways racial, sexual, and economic oppression work interdependently and are institutionalized. Follows black women's agendas for social change from the early women's slave narratives to the present. Cross-listed with ETST 113.

HISA 135 The Civil Rights Movement, 1950-1970 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The Civil Rights Movement of the 1950s and 1960s. The main focus will be on the "grass roots." African

American aspects of "The Movement," as it was popularly known, from school desegregation to voting rights and beyond. Cross-listed with ETST 112.

HISA 136 Historical Perspectives On Mass Incarceration 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Historical perspectives on U.S. mass incarceration. Explores historic roots of conquest, colonialism, racial subjugation, capitalism, and labor systems linking current mass incarceration, detentions, and deportations of unauthorized immigrant classes. Examines critical historic turning points and current social, economic, and political dynamics. Course meetings alternate between historic and contemporary issues.

HISA 137 Borderlands History of the United States 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the frontier in U.S. history focusing on the Western frontier and Spanish borderlands. Cross-listed with LNST 147.

HISA 138 California 4 Lecture, 3 hours; written work, 1 hour; term paper, 2 hours. Prerequisite(s): HISA 137 or LNST 147 is recommended; restricted to class level standing of junior, or senior; or consent of instructor. The history of California from the earliest discoveries to the present.

HISA 139 American Musical Subcultures: A Genealogy of Rock 4 Lecture, 3 hours; extra reading, 0 to 2; listening, 2-3 hours. Prerequisite(s): upper-division standing or consent of instructor. A historical and cultural overview of the genre of American popular music known as "rock." Covers themes ranging from musical form and structure, aesthetics, and audio technology to community and individualism, gender and racial identity, political resistance, and the music industry. Cross-listed with MUS 140.

HISA 140 California Indian History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Provides students with a broad understanding of the rich and varied heritage and history of California Indians from the invasion of the Spanish to the twentieth century. Examines geographically and culturally diverse groups as a means of illustrating the various Euro-American Indian policies that affected native Californians. Course is comparative and thematic. Cross-listed with ETST 180.

HISA 141 Southwestern Indian History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Presents a historical examination of selected Native American groups in the Southwest. Examines the relationship of Southwestern Indians to the Spanish, Mexican, and United States governments. Focuses on Quechans, Tohono O'Odom, Yavapai, Chiracahuas, Navajos, Zunis, Hopis, Comanches, and selected Pueblos along the Rio Grande. Cross-listed with ETST 181.

HISA 142 Northwestern Indian History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines selected aspects of Northwestern Indian History, from approximately the 1750s to the twentieth century. Deals with several native groups along the Northwest coast from Alaska to Oregon. Compares policies of the Russian, Spanish, English, and United States governments. Particular emphasis on the 1850s when the U.S. negotiated a number of treaties with Native Americans in the Washington and Oregon territories. Cross-listed with ETST 182.

HISA 144 (E-Z) Topics in Native American History 4 Lecture, 3 hours; individual study, 3 hours. Selected topics addressing the issues of the Native American. Includes reading, research, and discussion on the Native American experience. F. Erly Amer:emergi Interpretatns. Cross-listed with ETST 115 (E-Z).

HISA 145 (E-Z) Topics in African American History 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines topics on the history of African Americans from slavery to the present. E. Black Women's History.

HISA 146 History of Native American Women 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines selected important aspects of the lives of Native North American women including their political, economic, and religious participation in their societies. Further traces historic changes in Native women's lives as a result of the colonization and examines the complex imagery of Native women that developed from colonial contact.

HISA 147 Medicine Ways of Native Americans 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the medical history of Native Americans. Focuses on traditional Native American medicine and how Western diseases, medical practices, health care, and policies influenced American Indian health. Topics include medicine people, rituals, ceremonies, smallpox, measles, influenza, anomie, accidents, diabetes, suicides, mental illness, and murders. Cross-listed with ETST 116.

HISA 150 United States Urban History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the broad political, economic, and social forces that have shaped American cities from the nineteenth century through the present. Examines the ways that cities both integrate and segregate diverse populations. Emphasis on the physical spaces in which race, class, and gender identities are constructed and contested.

HISA 160 Colonial Latin America 4 Lecture, 3 hours; extra reading; 2 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A history of Latin America from pre-Columbian times to independence with an emphasis upon selected themes concerning the social, economic, and cultural aspects of colonialism. Cross-listed with LNST 170.

HISA 161 Nineteenth-Century Latin America 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics include the breakdown of political order and the problem of the nation-state, liberalism and conservatism, slavery and abolition, foreign intervention and capital investment, the reemergence of political order in the Age of Liberalism (1860-1900), and social and cultural change. Cross-listed with LNST 171.

HISA 162 Twentieth-Century Latin America 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Topics include the Mexican Revolution, the Great Depression, populism, industrialization, revolution, and the emergence of conservative regimes in the age of neoliberalism. Cross-listed with LNST 172.

HISA 163A Colonial Mexico 4 Lecture, 3 hours; extra reading, 2 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. The history of Mexico to independence.

HISA 163B Modern Mexico 4 Lecture, 3 hours; extra reading, 2 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. The history of Mexico since independence.

HISA 164A The United States and Latin America to 1930 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of United States-Latin American relations from 1776 to the Good Neighbor Policy. Topics include the Monroe Doctrine; United States expansionism and the Latin American response; the United States-Mexican War; and the age of imperialism, 1895-1928.

HISA 164B The United States and Latin America Since 1930 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of United States-Latin American relations from the Good Neighbor Policy to the present. Topics include United States intervention after 1945; the Cold War and counterrevolution; crises in Guatemala, Cuba, Brazil, Chile, Nicaragua, and El Salvador; and defining the new enemy after the Cold War.

HISA 165 Modern Brazil: State and Society 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes power and resistance in Brazilian history with emphasis on the social and political movements challenging state power. Topics include slave rebellions, banditry, millenarian uprisings, the industrial working class, the urban poor, social Catholicism, feminism, and "Black Power."

HISA 166 Modern Argentina: Democracy and Dictatorship 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division

standing or consent of instructor. Examines the major issues in modern Argentine history. Topics include industrialization and trade union politics, Peronism, the rise of the revolutionary left, militarism, state terrorism, political culture and the cultural dimensions of violence, and state and society during the democratic transition.

HISA 167 Environmental History of the Americas 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the interaction of the natural world with human society from the colonial period through the twentieth century. Focuses on how the environment, human beings, and other species have lived, changed, and generally influenced one another over time in the Americas.

HISA 168 History of the Church in Latin America 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the history of the church (e.g. Catholic, Protestant) in Latin America. Includes conquest and mission, indigenous responses to Christian conversion, the long colonial period, independence, revolution, and liberation theology movements. Explores the dynamics of church and culture, church and state, and church and social transformation. Cross-listed with RLST 177.

History of Europe

Upper-Division Courses

HISE 110 Ancient Historians 4 Lecture, 3 hours; research, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. The historical development of historiography as evidenced in ancient historical writings from Near Eastern king lists and biblical histories to the narrative histories of Greece and Rome. Focuses on the ideas of history in the various cultures of the ancient Near East and Mediterranean and their relation to modern historical thought. Cross-listed with CLA 100.

HISE 111 Ancient Greece From the Bronze Age to the Persian Wars 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of the history of Greece from the late Bronze Age to the end of the Persian Wars. Focuses on the Mycenaean civilization; the rise of the polis in Athens and Sparta; the Ionian Enlightenment; and the Persian Wars.

HISE 112 Ancient Greece From Classical Athens to the Death of Alexander 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of the history of Greece from the Persian Wars to the death of Alexander the Great. Focuses on Athens, its empire and democracy, and on the Macedonian Empire of Philip and Alexander. Special attention is given to the Greek cultural achievement within the context of changing political and social conditions.

HISE 113 Comparative Ancient Historical Writing 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the literary aspects of historical writing in ancient cultures, with some comparison of the ancient contribution to later authors of the genre. Cross-listed with CPAC 112, and CLA 113.

HISE 114 Ancient Writing and Literacy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Uses cross-cultural comparison to survey writing and literacy in ancient civilizations and how they are related in the origin and development of selected ancient cultures. Cross-listed with CPAC 133.

HISE 115 The Roman Republic 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the political, economic, institutional, social, and cultural history of Rome from its foundation until the end of the Roman Republic (27 B.C.). Focuses on prominent figures and moments of crisis as it examines the forces that brought Rome to the forefront of the Mediterranean world.

HISE 116 The Roman Empire 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the political, economic, institutional, social, and cultural history of the Roman Empire from the first Emperor, Augustus, until the first Christian emperor, Constantine. Focuses on notable figures such as the Julio-Claudian emperors, Nero and Claudius, and on significant periods to help students understand the successes and failures of the Roman Empire.

HISE 117 Decline and Fall of the Roman Empire 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the weaknesses in the Roman Empire that led to its demise, as well as the circumstances in which the new religions and empires came into existence, through a study of the period from the third to the seventh centuries A.D.

HISE 118 Ancient Greece: the Hellenistic Age From Alexander to Cleopatra, 336-31 B.c. 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Surveys of the history of Greece and the Eastern Mediterranean from Alexander the Great to the death of Cleopatra (336-31 B.C.). Explores the dramatic political, social, economic, and cultural changes that took place during the Hellenistic Age until the conquest by Rome.

HISE 119 (E-Z) Topics in Ancient History: War in the Ancient Greek World 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): HIST 010 or HISE 110 or HISE 111 or HISE 112 or HISE 118; restricted to class level standing of junior, or senior. Focused analysis of selected topics in the history of the Ancient Mediterranean region.

HISE 119E War in the Ancient Greek World 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing; HIST 010 or HISE 110 or HISE 111 or HISE 112 or HISE 118; or consent of instructor. Examines the relationship between war and society in Greece from the Bronze Age to Alexander the Great. Topics include the organization of Greek states and their military forces, conduct on the battlefield, and the impact of war on Greek communities and their members.

HISE 119F War in the Ancient Roman World 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing; HIST 010 or HISE 110 or HISE 115 or HISE 116 or HISE 117; or consent of instructor. Examines the relationship between war and society in Rome from the city's founding to the fall of the Roman Empire. Topics include the development of Rome's army in relation to Roman society, struggles to control the military, conduct on the battlefield, and the impact of war on Rome and its neighbors.

HISE 120 Early Middle Ages 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics in medieval history, from the end of classical antiquity to the 11th Century, including Christianity, Islam, the Byzantine Empire, and the barbarians.

HISE 121 The High Middle Ages 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics in medieval history, from the 11th to the 14th century, including the development of medieval institutions, the 12th century Renaissance, and the rise of European universities.

HISE 123 Law and Society in Medieval Europe 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Surveys the legal system of Europe from the late crisis of the Roman Empire to the late fourteenth century. Explores the premedieval legal heritage of Europe (Roman law, early canon law, customary laws of various peoples), transformations of that heritage in the central Middle Ages (revival of Roman and canon law, custom and legislation, use and abandonment of the ordeal), and the relationship between the resulting legal systems and royal authority. Primary sources are the central component of the course materials.

HISE 131 The Renaissance 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The history of Western Europe from 1400-1527 with special attention to Italy.

HISE 132 The Reformation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The history of Europe from 1517 to 1618, with special attention to the key events of the continental reformation.

HISE 133 Women Artists in Renaissance Europe, 1400-1600 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of

sophomore, junior, or senior. Surveys the lives and work of women artists in Renaissance Europe. Considers circumstances under which it was possible for women to become artists; how they evolved from practicing in the cloistered convent to participating in the competitive public market place; what they painted; and who their patrons were. Cross-listed with AHS 165, and GSST 170.

HISE 135 Absolutism and Enlightenment 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. The development of monarchic absolutism in the 17th and 18th centuries and the intellectual Enlightenment.

HISE 140 Nineteenth-Century Europe 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The history of Europe from 1815 to 1914. Topics include the Industrial Revolution, the revolutions of 1848, Bismarck and the unification of Germany, the rise of mass politics, imperialism, and the origins of World War I.

HISE 141 Europe, 1914-1945 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The history of Europe from 1914 to the end of the Second World War. Topics include World War I, the rise of fascism and communism, the crisis of the Western democracies, the diplomacy of appeasement, World War II, and the Holocaust.

HISE 142 Europe Since 1945 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. The comparative social and political history of Europe from 1945 to the present. Topics include the cold war; decolonialization; the emergence of the neoliberal welfare state; the Common Market; de Gaulle, Communism and detente; technology and new forms of social protest.

HISE 145 World War I 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the origins of the conflict and its development into the world's first war and the first total war. Focuses on the role of technology in the war and on the social consequences of the war. Credit is awarded for only one of HISE 145 or HISE 145S.

HISE 145S World War I 5 Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the origins of the conflict and its development into the world's first war and the first total war. Focuses on the role of technology in the war and on the social consequences of the war. Credit is awarded for only one of HISE 145 or HISE 145S.

HISE 146 The Second World War 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores the diplomatic origins of the war; the fighting in Europe, Asia, and Africa; Nazi oppression in conquered Europe and the destruction of the Jews; the social, economic, and technological impact of the conflict; and the origins of the Cold War. Credit is awarded for one of the following HISE 146 or HISE 146S.

HISE 146S The Second World War 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2, hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores the diplomatic origins of the war; the fighting in Europe, Asia, and Africa; Nazi oppression in conquered Europe and the destruction of the Jews; the social, economic, and technological impact of the conflict; and the origins of the Cold War. Credit is awarded for only one of HISE 146 or HISE 146S.

HISE 147 The Holocaust 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the extermination of European Jewry during World War II. Surveys the history of the "Jewish Question"; Jewish-Christian relations; race; the systematic persecution and genocide of the Jews; and world responses to genocide. Addresses religious, philosophical, and political implications of the Holocaust, as well as continuing anti-Semitic trends. Cross-listed with RLST 127.

HISE 148A Women and Gender in Early Modern Europe, 1348-1800 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introductory survey of women and gender relations in early modern Europe. Topics include women in the Italian Renaissance, the Protestant and Catholic reformations, the witchcraft persecutions, the Enlightenment, and the French Revolution.

HISE 148B Women and Gender in Europe, 1800-Present 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introductory survey of women and gender in Europe. Topics include changes in gender relations and the roles of women in the family, workplace, and politics; sexuality and science; and the debate over the "woman question."

HISE 149 The Body in Western Art: Antiquity to Present 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; Restricted to major(s) Anthropology, Art History, Art History/Admin Studies, Art History/Religious Studies, Gender and Sexuality Studies, History, History/Administrative Studies, History/Law and Society; or consent of instructor. Presents further questions and study of the human body and how it was depicted and interpreted in works of art from Roman Antiquity to the present. Explores a broad range of artworks in their specific historical, cultural, medical, social, religious, political, and intellectual contexts. Cross-listed with ANTH 161, GSST 130, and HISE 149. Credit is awarded for one of the following AHS 133, ANTH 161, GSST 130, HISE 149, or AHS 016.

HISE 150 Ancient and Medieval England 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A broad but occasionally intensive survey of England from its prehistory to the beginning of the Tudor period (c. 1500). Social and legal developments will be stressed.

HISE 151 England: 1485-1760 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the development of England from the sixteenth century until her emergence as a major power at the accession of George III. An assessment of social, economic, and legal changes as well as important political events.

HISE 152 Modern Britain 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the rise of Great Britain to world domination in the late eighteenth and nineteenth centuries and its subsequent fall from grace in the twentieth century. Special emphasis on major changes in the economy.

HISE 153 History of the Common Law 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the development of the English Common Law beginning with the reign of Henry II and extending into the early eighteenth century. Special attention to the history of the jury.

HISE 154 The History of London 4 Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper division standing or consent of instructor. Examines the growth of London over the past 2000 years. Concentrates on how London became a world city, as well as how residents coped (or failed to cope) with the social and environmental problems created by the city's enormous size.

HISE 155 Tudor England 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines sixteenth-century England with particular attention to the impact of the Reformation, the "price revolution," and the development of the state.

HISE 156 Stuart Britain: A Century of Revolution, 1603-1714 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the social, religious, and political tensions in seventeenth-century Britain. Particular attention is paid to the revolutions of 1637-1660 and 1688-89.

HISE 157 Eighteenth-Century Britain, 1714-1815 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes Great Britain's emergence as one of the dominant world powers in the eighteenth century. Particular attention is paid to the realm's social and economic transformation and to its often problematic imperial visions.

HISE 160 India and the British Empire 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the trends and consequences of the relationship between Britain and India from initial trading contacts in the seventeenth century, through colonization, and on to political independence

and migration flows in the late twentieth century. Focuses on cultural interactions.

HISE 162 Germany From Bismarck to Hitler 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Germany from Bismarck's accession as chancellor in 1862 to Hitler's defeat in 1945, with special attention to the economic underpinnings of the period and the process of social and economic modernization.

HISE 163 Modern German History Through Film 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores twentieth-century German history through film. Includes World Wars I and II, inflation and polarization of classes, Nazi Germany, representations of the Holocaust, and a divided and reunited Germany. Cross-listed with GER 163, MCS 115, and CPLT 115.

HISE 168 (E-Z) Topics in European History 4 Lecture, 3 hours; extra reading, 3 hours. Selected topics addressing the issues of European history F. Religious Conflict And Coexistence In Europe; G. Spain As A World Power, 1469-1821.

HISE 171 Early Russia 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the multi-ethnic origins of the Kyivan state, the Mongol conquest, the rise of Moscow, the Time of Troubles, and seventeenth-century imperial expansion into Ukraine and Siberia.

HISE 172 Imperial Russia 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Russia under the Romanov dynasty, 1650-1917. Using the twin themes of absolute monarchy and the rise of revolutionary movements, the course deals with such topics as Peter the Great, autocracy, the nobility, serfdom, the radical intelligentsia, and the origins of the Russian Revolution.

HISE 173 Religion and Nationality in Imperial Russia 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Introduces the great religious, national, and ethnic diversity inside the Russian Empire (1552-1917). Topics include colonial expansion and frontiers; attitudes and policies toward non-Russians; discovery and defense of ethnoreligious identities; nation-building and nationalisms; nationality conflicts; violence; and revolution.

HISE 174 Russia Since 1917 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Russia from 1917 to the present, with emphasis on the Russian Revolution, the Communist Party, Stalinism, the Great Purges, World War II, and the Khrushchev, Brezhnev, and Gorbachev years. Revolutionary change in a traditional society will be a central theme.

HISE 175 (E-Z) Topics in Russian History 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): HISE 172 or HISE 174. Selected topics addressing the issues of Russian history. E. The Stalin Period.

HISE 176 Serbia, Bosnia, and Kosovo: the Contemporary Crisis and its Historical Roots 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores historical precedents for the current Yugoslav crisis. Examines the tragic events of the 1990s and South Slavic history from the Ottoman conquest to World War II. Focus is on the national histories and mythologies of Serbs, Bosnians, and Albanians.

Humanities, Arts, and Social Sciences

Subject abbreviation: HASS
College of Humanities, Arts, and Social Sciences

hass.ucr.edu

Committee in Charge

John Laursen (Political Science)
Erich Reck (Philosophy)
Daryle Williams, Dean, *ex officio*

Major

The Humanities, Arts, and Social Sciences major is an interdisciplinary major designed for students who have specific interests that cannot be accommodated within any one of the departments in the College of Humanities, Arts, and Social Sciences and who wish to construct a coherent program of their own. The Humanities, Arts, and Social Sciences major is not intended for students whose interests are undecided; students proposing a Humanities, Arts, and Social Sciences major must propose a specifically focused interdisciplinary topic or a two-field area. Such students must have a faculty advisor who is a member of the UCR Academic Senate.

The Humanities, Arts, and Social Sciences major is fulfilled by a course of studies determined in consultation with an advisor and with the full approval of the chair and three members of the committee overseeing the major. The student may construct either an interdisciplinary option or a two-field option for the major as described below.

Admission

Students who wish to select a Humanities, Arts, and Social Sciences major must fill out a form and submit a carefully worded statement of purpose showing meaningful course interrelations. The Humanities, Arts, and Social Sciences Interdisciplinary Committee considers each proposal in the context of the student's topic and statement of purpose.

Students whose proposals are being approved should petition for a change in major only after they have been informed of the committee's approval of their interdisciplinary program. Every subsequent change in the student's initial program must be approved by the advisor; a record of the program and of program changes is kept in the student's files.

Humanities, Arts, and Social Sciences courses are supervised by the committee and are open to major as well as nonmajor students.

Interdisciplinary Option

The interdisciplinary option is built around a central concept in humanities and social sciences. The concept might be a specific culture, country or ethnic group such as Italian civilization and culture; an age or period such as the Renaissance or the industrial revolution; a great social issue or human problem such as war, revolution, communication; or any other topic which receives significant attention from several disciplines.

Two-Field Option

In special circumstances the committee sponsors a two-field option for the major designed to allow students to combine studies in two disciplines. Such majors are approved only if they cannot be accommodated within a dual major or within the Liberal Studies Program.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The major requirements for the B.A. degree in Humanities, Arts, and Social Sciences are as follows: Students may choose either an interdisciplinary or a two-field option.

Interdisciplinary Option

1. Upper-division requirements (38-unit minimum)
   a) A minimum of 32 units directly related to the chosen central concept
   b) At least 6 units (but not more than 8 units) HASS 195 and/or HASS 196
2. The committee may require upper-division courses beyond those indicated above if the topic of study requires specific language, quantitative, or methodological proficiency.

Note

The senior thesis or research paper is the culmination of the major and represents an interdisciplinary approach to the central concept of the major. HASS 195 (Senior Thesis) and HASS 196 (Senior Research Paper) are supervised by a faculty advisor and designed to bring into focus a substantial portion of the major.

The following are sample interdisciplinary programs:

Revolution

ANTH 127, ECON 115A or ECON 115B, HIST 104, HISE 174, POSC 112, PHIL 163, PHIL 153, HASS 195 (8 units).

Renaissance

AHS 161, CPLT 150J, ENGL 153, ENGL 154, HISE 131, MUS 101A, SPN 140 (E-Z), HASS 195 (8 units).

Two-field Option

1. Upper-division requirements (56 units) Twenty-eight (28) units in each of two fields, supervised by a faculty advisor
2. The committee may require upper-di-

vision courses beyond those indicated above if the topic of study requires specific language, quantitative, or methodological proficiency.

Lower-Division Courses

HASS 001 Step-By-Step to College Success For First Year Students 2 Lecture, 1.5 hours; extra reading, 3 hours; individual study, 1.5 hours. Prerequisite(s): restricted to class level standing of junior; or consent of instructor. Explores the factors relating to academic success. Addresses the social and psychological adjustment to college life. Investigates a wide range of academic disciplines and campus student support services. Offered online only. Graded Satisfactory (S) or No Credit (NC).

HASS 010 Arts and Ideas Experience 2 Workshop, 2 hours; individual study, 3 hours; written work, 2.5 hours. Prerequisite(s): none. Explores lectures, performances, and visual arts on the UC Riverside campus. Activities include attending at least one university- or faculty-sponsored performance, lecture, exhibition, or concert each week and writing a one-page review. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 24 units.

HASS 082 Major Themes in Contemporary Research and Thinking 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. Presents major themes in contemporary thinking and research in an area of the humanities, arts, or social sciences. Discussion sections focus on study of smaller topics and utilize source materials, selected intensive readings, etc. Emphasizes research and writing skills. Rotates among College of Humanities, Arts, and Social Sciences faculty and departments every year. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable as topics change to a maximum of 10 units.

HASS 090 Special Studies 1 to 3 Individual Study, 3 to 9 hours. Prerequisite(s): consent of the chair of the Humanities, Arts, and Social Sciences Interdisciplinary Program. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 8 units.

HASS 092 First-Year Seminar in the Humanities, Arts, and Social Sciences 1 Seminar, 10 to 15 hours per quarter. Prerequisite(s): freshman standing; sophomores may enroll on a space-available basis with consent of instructor. Introduction to one of the many areas of study explored by the faculty of the College of Humanities, Arts, and Social Sciences in a small-group, highly interactive format. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 3 units of any combination of ENGR 092, HASS 092, and NASC 092; students may enroll in only 1 unit of ENGR 092, HASS 092, or NASC 092 per quarter.

HASS 096 Environment and Society 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): lower-division standing or consent of instructor. Presents major environmental issues facing society from an interdisciplinary perspective. Topics may include water, energy, climate change, and urbanization. Cross-listed with NASC 096, and ENGR 096.

Upper-Division Courses

HASS 100 Studies in Leadership and Organizational Effectiveness 5 Lecture, 3 hours; consultation, 3 per quarter, practicum, 3 hours; written work 21 hours per quarter. Prerequisite(s): consent of the instructor Introduces social science literature on leadership studies. Includes planning and producing a campus event or research project and interaction with several California leaders.

HASS 102 The Mcsweeny-Mccauley Seminar 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): consent of instructor. Presents a topic selected by the current McSweeny-McCauley Chair in Teaching Excellence. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable as topics change to a maximum of 16 units.

HASS 189A Becoming An Scholar 4 Seminar, 2 hours; research, 3 hours; consultation, 1 hour. Prerequisite(s): admission into the Mellon Mays Undergraduate Fellowship Program; restricted to class level standing of junior, or senior. Prepares Mellon Mays Undergraduate Fellows to become scholars and academics. Focuses on the different paths open after the BA, especially those conducive to PhDs. Provides extensive training in how to apply to graduate school and how to be successful as an academic. Course is repeatable as content or topic changes to a maximum of 12 units.

HASS 189B Conducting Academic Research 4 Seminar, 2 hours; research, 3 hours; consultation, 1 hour. Prerequisite(s): admission into the Mellon Mays Undergraduate Fellowship Program; restricted to class level standing of junior, or senior. Focuses on acquiring writing skills in this second course of the Mellon Mays Undergraduate Fellowship program. Also presents how to structure longer projects and organize workflows of writing. Course is repeatable as content or topic changes to a maximum of 12 units.

HASS 189C Writing as An Academic 4 Seminar, 2 hours; research, 3 hours; consultation, 1 hour. Prerequisite(s): admission into the Mellon Mays Undergraduate Fellowship Program; restricted to class level standing of junior, or senior. The third course of the Mellon Mays Undergraduate Fellowship program focuses on presentation skills and presenting works to academic communities. Includes opportunities to speak at public events and conferences. Course is repeatable as content or topic changes to a maximum of 12 units.

HASS 190 Special Studies 1 to 5 Conference, Prerequisite(s): consent of the Humanities, Arts, and Social Sciences Interdisciplinary Committee. Directed interdisciplinary study.

HASS 191S Seminar in Sacramento 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Center at Sacramento Program. Examines aspects of the Sacramento area, including cultural, political, and governmental institutions and the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Sacramento. Required of participants in the UCR Center at Sacramento Program. Cross-listed with NASC 191S, and ENGR 191S.

HASS 195 Senior Thesis 1 to 8 Prerequisite(s): enrollment by request of student with approval of the advisor and the Humanities, Arts, and Social Sciences Interdisciplinary Committee. For honors students who may need one or more quarters to complete the research and writing of a senior thesis. Course is repeatable to a maximum of 12 units.

HASS 196 Senior Research Paper 1 to 4 Prerequisite(s): consent of advisor.

HASS 198I Internship 1 to 12 Internship, 10 hours per week for each 4 units, Prerequisite(s): upper-division standing and approval of Committee on Independent Student Projects A student-defined project, the major portion of which is taken off campus. May be supervised by an off-campus instructor and/or UCR advisor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.


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GRAND
MASTER

Inflammation and Infectious Disease Designated Emphasis

Subject abbreviation: IID
School of Medicine

Monica Carson (Biomedical Sciences), Co-Director
Emma Wilson (Biomedical Sciences), Co-Director

monica.carson@ucr.edu
emma.wilson@ucr.edu

Advisory Committee & Participating Faculty

James Borneman (Microbiology)
Katherine Borkovich (Microbiology)
Monica Carson (Biomedical Sciences)
Qi Chen (Biomedical Sciences)
Djurdjica Coss (Biomedical Sciences)
Nicholas DiPatrizio (Biomedical Sciences)
Iryna Ethell (Biomedical Sciences)
Byron Ford (Biomedical Sciences)
Adam Godzik (Biomedical Sciences)
Rong Hai (Plant Pathology and Microbiology)
Erica Heinrich (Biomedical Sciences)
Ansel Hsiao (Plant Pathology and Microbiology)
Marcus Kaul (Biomedical Sciences)
Karine LeRoch (Microbiology)
Huinan Liu (Microbiology)
David Lo (Biomedical Sciences)
Christian Lytle (Biomedical Sciences)
Wenbo Ma (Microbiology)
Declan McCole (Biomedical Sciences)
Juliet Morrison (Plant Pathology and Microbiology)
Meera Nair (Biomedical Sciences)
Scott Pegan (Biomedical Sciences)
Maurizio Pellecchia (Biomedical Sciences)
Seema Tiwari-Woodruff (Biomedical Sciences)
Shou-Wei Ding (Microbiology)
Emma Wilson (Biomedical Sciences)
Sika Zheng (Biomedical Sciences)
Changcheng Zhou (Biomedical Sciences)

Designated Emphasis Requirements

The Designate Emphasis is an interdisciplinary graduate program of study to enhance student training in the field through a focused coursework across at least two departments. The program is optional and the courses used for the DE may not be counted toward M.S. or Ph.D. requirements.

1. Three (3) courses (12-14 units) with a focus in the basic principles of immunology and infectious disease will be selected from:

   MCBL 124 Pathogenic Microbiology

   BMSC 236 Foundations of Medicine II*

   MCBL 202 Microbial Pathogenesis

   MCBL 221 Microbial Genetics

   BMSC 223E Inflammation, Autoimmunity an Pathogen Defense

   *If taking BMSC 236 (10 units) only two courses are required for completion.

   Students must select courses with relevant content as approved by the Designated Emphasis Advisory Committee comprising of three participating faculty including the student's major professor. Students must select courses from at least two different departments. Undergraduate course taken to fulfill the requirement must be accompanied by a 292 course taken in the same quarter with extra work agreed upon by the professor and student.
2. BMSC 222 (2 units): Special Topics in Biomedical Sciences with emphasis in infectious diseases. The course will address the research pertaining to the student's interest and prepare trainees in applying the knowledge of basic principles of immunology to the pathophysiology of infectious disease. Graded Satisfactory (S) or No Credit (NC)
3. Research Project: students will write a review article on a selected inflammation or infectious disease topic. The review will be evaluated by the Designated Emphasis Advisory Committee. It is the committee's expectation that student will fulfill this component by submitting the review article for the journal publication. Successful completion of this review is required for the Designated Emphasis completion.

   All requirements for the Designated Emphasis must be satisfied no later than one calendar year from the quarter in which candidate advances to candidacy in their Ph.D. field; a minimum GPA of 3.0 is required for the Designated Emphasis completion.

Interdisciplinary Studies

College of Humanities, Arts, and Social Sciences

Committee in Charge
(In Moratorium)

The Interdisciplinary Studies major is not currently accepting new students. For more information, contact CHASS Student Academic Affairs, 3400 Humanities and Social Sciences Building, (951) 827-3683.

International Relations Minor

College of Humanities, Arts, and Social Sciences

Marissa Brookes, Ph.D., Chair
mbrookes@ucr.edu

Committee in Charge

Marissa Brookes, Chair (Political Science)
Marcelle Chauvet (Economics)
Thomas Cogswell (History)
Daryle Williams, Dean, *ex officio*

Offered by the department of Political Science, the International Relations minor offers a basic examination of the major approaches, disciplines, and perspectives of international relations. The study of international relations is necessarily interdisciplinary, focusing on economic, geographic, historical, and political issues and questions.

The International Relations minor is helpful in preparing students for the many careers in the international arena.

Requirements for the minor (28 units)

1. Eight (8) units from HISA 117B, HISE 142, HISE 146, HISA 164B, HISE 174, HIST 182
2. Eight (8) units from ECON 171, ECON 175, ECON 178/BUS 178, ECON 181, ECON 182, ECON 185/LNST 185
3. POSC 124 or POSC 124S
4. Eight (8) units from POSC 123, POSC 125, POSC 126 or POSC 126S, POSC 127/SEHE 127, POSC 128, POSC 129, POSC 130, POSC 155 or POSC 155S, POSC 160 or POSC 160S

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Journalism Minor

College of Humanities, Arts, and Social Sciences

Andrew Winer, M.F.A., Chair
Department Office, ARTS 129 (951) 827-5424;
creativewriting.ucr.edu

Committee in Charge

Mike Davis, M.A. (Creative Writing)
Martin Johnson, Ph.D. (Political Science)
Milagros Peña Ph.D. *Dean, College of Humanities, Arts and Social Sciences, ex officio*

Offered by the Department of Creative Writing, the minor offers basic examination of the theory, practice and ethics of contemporary journalism, with an emphasis on reporting and editing. Coupled with work on student publications and internships, the minor serves as an entryway to professional writing in news media or to graduate study in journalism.

Lower-division requirements (9 Units)

1. ART 003
2. CRWT 057C

Upper-division requirements (20 units)

1. Eight (8) units:
   a) CRWT 165
   b) CRWT 175
2. Eight (8) units:
   a) CRWT 174
   b) One (1) course either from an approved list of media-related upper-division courses, or, with the approval of the academic advisor for journalism minors, an upper-division course relevant to an area of journalism specialization.
3. Either CRWT 195: Senior Thesis [4], or CRWT 1981: Internship [4]. Students electing a thesis will complete a series of news features or an investigative article or series requiring significant endeavor in reporting and writing and demonstrating an understanding of sound journalistic principles. CRWT 195 is open to seniors only. Students completing CRWT 198I must complete 4 units of internship with a journalism organization.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Labor Studies Minor

Subject abbreviation: LABR
College of Humanities, Arts, and Social Sciences

Ellen Reese, Ph.D., Director
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Committee in Charge

Ellen Reese, Director (Society, Environment, and Health Equity)
Michael Bates (Economics)
Marissa Brookes (Political Science)
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Alfonso Gonzales Toribio (Ethnic Studies)
John N. Medearis (Political Science)
Keith Miyake (Ethnic Studies)
Dylan Rodriguez (Black Study, Media & Cultural Studies)
Richard Rodriguez (English)
Kevin Shih (Economics)
Miriam Venturini (Economics)
Daryle Williams, Dean, *ex officio*

Labor studies is an interdisciplinary minor that focuses on the conditions, activities, and struggles of workers and other members of the working class from an international, contemporary, comparative and historical perspective. Although trade unions are the primary focus, students will also examine other forms of working class organizing, including community organizing, and organizing by women and people of color. Courses focus on work in formal workplaces, including service, industrial, clerical, professional, and managerial work, and may also address other forms of work, such as unpaid housework, prison labor, or work in the informal economy. The minor addresses issues affecting workers, including governmental policies, technological change, globalization, neoliberalism, and alternative models for organizing for social justice. In addition to taking academic courses, students gain hands-on experience through a one-quarter internship with a union or related organization. This minor helps to prepare students for careers in labor and community organizing, labor law, or labor regulatory agencies.

Requirements for labor studies minor are as follows:

1. Five courses (at least 20 units) from the approved list of courses
2. One of the following 'core' courses: LABR 001, ETST 102, SOC 112, SOC 135, GSST 101, LABR 138/POSC 138, LABR 138S/POSC 138S
3. A labor internship course (at least 4 units or the equivalent) completed through the following course: LABR 198-I or LABR 198-G/SEHE 198-G
4. One course (at least 4 units) that address inequality based on gender, race, and/or sexual orientation: ANTH 122, ANTH 139, ANTH 144G/GSST 140, ANTH 149/GSST 149, DNCE 135, ECON 155/GSST 155/PBPL 155, ETST 100, ETST 101A, ETST 101B, ETST 102, ETST 105A, ETST 105B, ETST 106, ETST 108 (E-Z), ETST 109F, ETST 109G, ETST 109I, ETST 110 (E-Z), ETST 112/HISA 135, ETST 113/HISA 134, ETST 115 (E-Z)/HISA 144 (E-Z), ETST 116/HISA 147, ETST 117 (E-Z)/HISA 137 (E-Z), ETST 118, ETST 119, ETST 121, ETST 123, ETST 124, ETST 126, ETST 127, ETST 128/SOC 128, ETST 131, ETST 132, ETST 133, ETST 136, ETST 137, ETST 139, ETST 140, ETST 143/SEAS 143, ETST 144, ETST 145/SOC 145, ETST 146/EDUC 146, ETST 147, ETST 148/ANTH 142G/LNST 168, ETST 149, ETST 153, ETST 155, ETST 157, ETST 158, ETST 159, ETST 161, ETST 163 (E-Z), ETST 167/PSYC 167, ETST 168/PSYC 168, ETST 174, ETST 175/GSST 175, ETST 177, ETST 178, ETST 179, ETST 180/HISA 140, ETST 181/HISA 141, ETST 182/HISA 142, ETST 184, ETST 185, ETST 186, ETST 187, ETST 188, ETST 189, GBST 110, GSST 100, GSST 101, GSST 103/ANTH 145, GSST 107, GSST 108/PHIL 108, GSST 109, GSST 133/HISA 133, GSST 136, GSST 150/ANTH 148, GSST 150, GSST 151, GSST 161, GSST 162/RLST 162, GSST 166/MCS 127, GSST 168, GSST 185/ANTH 144F, GSST 186, GSST 185/ANTH 144F, GSST 186, GSST 189, HISA 115, HISA 132/GSST 132, HISA 146/GSST 146, HISE 148B, LGBS 128/GSST 128, LGBS 134/GSST 134, LGBS 135/GSST 135, LGBS 137/GSST 137, LGBS 139/GSST 139, POSC 108, SEHE 176, SOC 129, SOC 130, SOC 131 (E-Z), SOC 132, SOC 140, SOC 141, SOC 155 (E-Z), SOC 162
5. Two courses from the following that address political economy, class and/or labor: ANTH 104, ANTH 105/BUS 158, GSST 109, ANTH 122, ANTH 139, ANTH 144G/GSST 140, ANTH 149/GSST 149, ANTH 144M, BUS 152/ECON 152, BUS 153/ECON 153, BUS 160/ECON 160, BUS 176/SOC 176, ECON 116, ECON 123/HISA 123, ECON 146/URST 146, ECON 155/GSST 155, ECON 182, ETST 102, ETST 108 (E-Z), ETST 109F, ETST 131, ETST 145/SOC 145, ETST 177, GBST 100, GSST 101, GSST 109, HISA 110C, HISA 113, HISA 117A, HISA 119, HISA 124, HISA 160/LNST 170, HISA 161/LNST 171, HISA 162/LNST 172, HISA 165, HISE 140, HISE 142, HIST 108/ENGR 108, HIST 109/ENGR 109, HIST 182, LABR 138/POSC 138, LABR 138S/POSC 138S, LABR 175/SEHE 175, PHIL 116, PHIL 153, POSC 116, POSC 116S, POSC 126, POSC 130, POSC 147, POSC 160A, POSC 164, POSC 164S, POSC 182, POSC 186, PSYC 142, SEHE 106, SEHE 106S, SOC 112, SOC 120, SOC 122, SOC 123, SOC 125, SOC 133, SOC 134, SOC 135, SOC 140, SOC 143/URST 143, SOC 150, SOC 151, SOC 156, SOC 161, SOC 181, SOC 183 (E-Z), SOC 184
6. Students can also petition to the chair of the program to count towards the minor an independent study or regular course not listed above that is relevant to labor studies.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Lower-Division Courses

LABR 001 Introduction to Labor Studies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Through comparative and historical perspective, examines the social forces shaping labor conditions and workers' struggles for justice. Covers the changing nature of work under capitalism, race and gender discrimination in the labor market, the impact of economic globalization, and unions' successes and limitations.

LABR 002 Labor Organizing: Theory and Practice 4 Lecture, 3 hours; individual study, 2 hours; written work, 1 hour. Prerequisite(s): none. Examines theory informing and approaches to labor, community, movement, and direct/collective action organizing. Explores the ideas, concerns, conditions, values, aims, strategies, and tactics associated with organizing in those different contexts. Considers cases of actual organizers and compares and contrasts recent and historical examples of organizing. Credit is awarded for one of the following LABR 002 or LABR 002S.

LABR 002S Labor Organizing: Theory and Practice 5 Lecture, 3 hours; discussion, 1 hour; individual study, 2 hours; written work, 1 hour. Prerequisite(s): none. Examines theory informing and approaches to labor, community, movement, and direct/collective action organizing. Explores the ideas, concerns, conditions, values, aims, strategies, and tactics associated with organizing in those different contexts. Considers cases of actual organizers and also compares and contrasts recent and historical examples of organizing. Credit is awarded for one of the following LABR 002S or LABR 002.

Upper-Division Courses

LABR 138 Labor and Globalization 4 Lecture, 3 hours; individual study, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the relationship between globalization and labor. Focuses on four key political actors that shape the workers'

fates in the global economy: transnational corporations, national governments, international organizations, and workers themselves. Cross-listed with POSC 138. Credit is awarded for one of the following POSC 138, LABR 138, LABR 138S, or POSC 138S.

LABR 138S Labor and Globalization 5 Lecture, 3 hours; discussion, 1 hour; individual study, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the relationship between globalization and labor. Focuses on four key political actors that shape the workers' fates in the global economy: transnational corporations, national governments, international organizations, and workers themselves. Cross-listed with POSC 138S. Credit is awarded for one of the following POSC 138S, LABR 138S, LABR 138, or POSC 138.

LABR 175 Transforming Toxic Jobs: Health and Work in the United States 4 Lecture, 3 hours; research, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines research on health and work including occupational health; how work and employment impact health outcomes and health care; work experiences of health care providers; and the role of policies and organized efforts by workers, their allies, and clients to improve health and well-being at work and in the community. Cross-listed with SEHE 175.

LABR 198G Group Internship in Labor Studies and Society, Environment, and Health Equity 4 Seminar, 3 hours; internship, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): LABR 001 or SEHE 001 or SEHE 002 or SEHE 002S; restricted to major(s) Environmental Studies, Global and Community Health, Labor Studies; completion of internship activities for 3 hours per week before enrollment; and consent of instructor. Examines strategies for organizing and advocating for environmental justice and health equity within working class communities generally and within the Inland Empire. Provides hands-on professional experiences with community organizations related to environment and/or health justice. Critically reflects on internship experiences through course readings, in-class discussions, writing assignments, and oral presentations. Course is repeatable as content or topic changes to a maximum of 16 units. Cross-listed with SEHE 198G.

LABR 198I Individual Internship in Labor Studies 1 to 12 Internship, 2 to 24 hours; written work, 1 to 12 hours. Prerequisite(s): upper-division standing; consent of instructor. Supervised experience in a labor union or related community organization. Focuses on the issues affecting workers and/or low-income people, as well as the prospects and challenges for achieving social justice for working-class people in the contemporary United States. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

Latin American and Latino Studies Designated Emphasis

Subject abbreviation: LAS
College of Humanities, Arts, and Social Sciences

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Curriculum Committee
Alonfso Gonzalez, Professor,
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Designated Emphasis Requirements

The Designated Emphasis is a rigorous course of study, requiring students to demonstrate focused coursework and research in the field with three core requirements:

1. Four (4) graduate courses (16 units) with at least one of these courses emphasizing U.S.-Latino experience and at least two with a primary axis of Mexico, Central America, South America, or the Caribbean. These courses must be taken in at least two different departments: AHS 260, ANTH 209, ANTH 218, ANTH 251, ANTH 264, ECON 260, ECON 261, ECON 262, ECON 264, ECON 265, ETST 223, ETST 244, ETST 245, ETST 246, HIST 206A, HIST 206B, HIST 285A, HIST 285B, MUS 271, MUS 263, POSC 278, PORT 201, SOC 243 (E-Z), SOC 261, SOC 265 (E-Z), SOC 282, SPN 257, SPN 258, SPN 270, SPN 272, SPN 273A, SPN 278, SPN 279, SPN 301.
2. Submission of a research portfolio within one year after the quarter in which the student advances to candidacy. The portfolio, to be reviewed by a standing committee of LAS faculty, will demonstrate significant research in the field, include two research papers and syllabi from the four courses accompanied by an introductory self-statement (of no more than 1000 words) articulating the particular research emphasis and its depth and breadth of engagement with the field along with an explanation of specific expertise and emphases.
3. Language certification is required through examination or coursework in a Latin American language: Spanish, Portuguese, Kreyol, or an indigenous language. Evidence of language certification must be included in the research portfolio (passing of a written translation exam, a full length (15pp+) research paper written in the language, or two or more years of language courses at the college or university level).

Latin American Studies

Subject abbreviation: LNST
College of Humanities, Arts, and Social Sciences

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Jennifer Hughes (History)
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Daryle Williams, Dean, *ex officio*

Affiliated Faculty
Eugene Anderson, Emeritus, Anthropology
Alicia Arrizon, Emeritus, Gender and Sexuality Studies & Media and Cultural Studies
Amalia Cabezas, Emeritus, Gender and Sexuality Studies & Media and Cultural Studies
Wendy Ashmore, Emeritus, Anthropology
Sara K. Becker, Anthropology
James Brennan, History
Rogerio Budasz, Music
Edgar Butler, Emeritus, Sociology
Amalia Cabezas, Ethnic Studies
Paulo Chagas, Music
Christopher Chase-Dunn, Sociology
Marcelle Chauvet, Economics
Xóchitl C. Chavez, Music
Ronald H. Chilcote, Emeritus, Economics
Walter Clark, Music
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Alejandra Dubcovsky, History
Scott Fedick, Anthropology
Adrian Felix, Ethnic Studies
Alessandro Fornazzari, Hispanic Studies
Armando Garcia, English
Alfonso Gonzales, Ethnic Studies
Paul Green, Education
Steven W Hackel, History
E. Mark Hanson, Education
Steven Helfand, Economics
Marta Hernandez-Salvan, Hispanic Studies
David Herzberger, Hispanic Studies
Jennifer Scheper Hughes, History/Religious Studies
Anthony Russell Jerry, Anthropology
Juliette Levy, History
Maria del Rosario Acosta Lopez , Hispanic Studies
William Megenney, Emeritus, Hispanic Studies
Claudia Holguin Mendoza, Hispanic Studies
Jennifer Najera, Ethnic Studies
Rhonda Neugebauer, Bibliographer, University Libraries
Julio Orellana, Ethnic Studies
Robert Patch, History
Thomas Patterson, Emeritus, Anthropology
Marina Pianca, Emeritus, Hispanic Studies
David Pion-Berlin, Political Science
Covadonga Lamar Prieto, Hispanic Studies
Jonathan Ritter, Music

Louie F Rodriguez, Graduate School of Education
Ricky Rodriguez, Media and Cultural Studies
Roberto Sanchez-Rodriguez, Environmental Sciences and UMEX
Freya Schiwy, Media and Cultural Studies/Hispanic Studies
Travis Stanton, Anthropology
Karl Taube, Anthropology
Kenichiro Tsukamoto, Anthropology
Christina Soto van der Plas, Hispanic Studies
Joao Costa Vargas, Anthropology
Raymond Williams, Hispanic Studies
Tara Yosso, Education

Major

Latin American Studies is an interdisciplinary, area studies major that allows students to combine insights from many related disciplines. The interdisciplinary focus permits students to study the anthropology, economics, geography, history, sociology, languages and cultures of the region to gain a broad understanding of a complex world area.

The Latin American Studies major provides great flexibility to explore a wide range of subjects of particular interest—from religious cults in the Caribbean to indigenous video in the Andes or the dynamics of agrarian reform in rural Mexico.

The flexibility of the major allows the possibility of completing a double major with other departments such as History, Anthropology, or Political Science.

UCR has a strong faculty in Latin American Studies, with more than 45 members drawn from departments across the campus. More than 125 courses taught at UCR have a significant focus on the region. The strength and breadth of the offerings at UCR permit each student to specialize in the particular country or discipline of greatest interest. Students have many opportunities to get involved in research projects with Latin American Studies professors. Students are encouraged to spend time living and studying in Latin America through, for example, Education Abroad.

Career Opportunities

The Latin American Studies major presents numerous opportunities after graduation. The interdisciplinary nature of the program prepares the student for further study in any number of academic fields at the graduate level, including anthropology, geography, history, sociology, Spanish and Portuguese, law, and journalism.

The B.A. degree itself is valuable preparation for many careers, including the U.S. foreign service, nongovernmental development and aid organizations, international organizations, large overseas corporations, banking, foreign missions, journalism and the media, and teaching.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The major requirements for the B.A. degree in Latin American Studies fall into three major groups. First, students must take Introduction to Latin American Studies (LNST 001) and satisfy a language requirement in either Spanish or Portuguese. Second, students choose three disciplinary areas in which to focus their upper-division work. They must take a total of 24 required units in these three areas. Finally, students take an additional 12 units of elective courses in Latin American Studies. Latin American Studies students are encouraged to take additional coursework at the lower and upper division levels.

The specific requirements for the major are as follows:

1. Lower-division requirements (5 units)
   a) Introduction to Latin American Studies (LNST 001) or an equivalent course from the following list of lower-division courses:

      LNST 015/ MUS 015, LNST 016/ MUS 016, LNST 017/ MUS 017, LNST 073A/DNCE 073A, LNST 073B/ DNCE 073B, ANTH 010, ANTH 027/AHS 027, AHS 028, ETST 002, ETST 004/ HIST 004, ETST 008, MCS 025/ ENGL 021/TFDP 021, MCS 046/ SPN 046, HASS 022A, GBST 001, GBST 002, HIST 075, POSC 020, RLST 009, RLST 011, SPN 012, GSST 031H, GSST 020

   b) Proficiency in Spanish to the SPN 005 level or in Portuguese to a comparable level

      Note Additional course work in Spanish and/or Portuguese recommended for students interested in careers in Latin American fields

2. Upper-division requirements (at least 36 units)
   a) At least two courses in three of the following groups (at least 24 units total):
      (1) Anthropology: ANTH 109/ GSST 109, ANTH 111, ANTH 115R, ANTH 115S, ANTH 115U, ANTH 115X, ANTH 117B, ANTH 140J, ANTH 140O, ANTH 161/LNST 161, ANTH 163, ANTH 164/LNST 164/GSST 164, ANTH 142G/ETST 148/LNST 168, ANTH 186/LNST 166, ANTH 144O

      (2) Economics and Business: BUS 114, BUS 138, BUS 185, ECON 122E, ECON 178, ECON 181, ECON 182, ECON 185/ LNST 185, ECON 187/LNST 187

      (3) Education/Language: ETST 146, ETST 165/SOC 165, ETST 166, PORT 101A, PORT 101B, PORT 101C, SPN 101A, SPN 101B, SPN 105, SPN 106A, SPN 106B, SPN 109A, SPN 109B

      (4) History: ETST 125, HISA 160/LNST 170, HISA 161/LNST 171, HISA 162/LNST 172, HISA 163A, HISA 163B, HISA 164A, HISA 164B, HISA 165, HISA 166, HIST 191V, SPN 172

      (5) Literature and Cultural Studies: ENGL 136, ENGL 136T, ENGL 137T, ETST 114, ETST 170/ WRLT 170, LNST 120/ SPN 120C, LNST 153/ETST 153, SPN 102B, SPN 111F, SPN 111W, SPN 121E, SPN 122A, SPN 145, SPN 165, SPN 170(E-Z), SPN 172, SPN 188(E-Z), PORT 162(E-Z), RLST 138

      (6) Arts, Media, and Performance Studies: AHS 112, AHS 113, AHS 115/ LNST 115, DNCE 130, DNCE 132, DNCE 135, ETST 154, MCS 125(E-Z)/SPN 125(E-Z)/LNST 125(E-Z), MCS 171/ SPN 171, LNST 105/MCS 185/SPN 185, LNST 109/MCS 179/SPN 179/GSST 179, MUS 113, MUS 115, MUS 122, MUS 174, MUS 175

      (7) Politics: ETST 111, ETST 123, ETST 156, POSC 157, POSC 159, POSC 160, LNST 142/POSC 162, LNST 148/POSC 158, SOC 181

      (8) Ethnic Studies and Sociology: ETST 108(E-Z), ETST 109G, ETST 124, ETST 127, ETST 128/SOC 128, ETST 129, ETST 132, ETST 142, ETST 155, ETST 161, ETST 163/SOC 163, ETST 165/SOC 165, SOC 181

   b) At least twelve (12) units selected from other Latin American Studies courses from the disciplinary areas above or from a list of upper-division courses with significant Latin American content available in the program office.

Minor

Latin American Studies offers a minor consisting of at least 20 upper-division units.

To complete the requirements for the minor, students must select five courses from two of the following groups:

1. Anthropology: ANTH 109/ GSST 109, ANTH 111, ANTH 115R, ANTH 115S, ANTH 115U, ANTH 115X, ANTH 117B, ANTH 140J, ANTH 140O, ANTH 144O, ANTH 161/LNST 161, ANTH 163, ANT 164/LNST 164/GSST 164, ANTH 142G/ETST 148/LNST 168, ANTH 186/LNST 166
2. Economics and Business: Economics and Business BUS 114, BUS 138, BUS 185, ECON 122E, ECON 178, ECON 181, ECON 182, ECON 185/LNST 185, ECON 187/LNST 187
3. Education/Language: ETST 146/EDUC 146, ETST 165/SOC 165, ETST 166, PORT 101A, PORT 101B, PORT 101C, SPN 101A, SPN 101B, SPN 105, SPN 106A, SPN 106B, SPN 109A, SPN 109B
4. History: ETST 125, HISA 160/LNST 170, HISA 161/LNST 171, HISA 162/LNST 172, HISA 163A, HISA 163B, HISA 164A, HISA 164B, HISA 165, HISA 166, HIST 191V, SPN 172
5. Literature and Cultural Studies: ENGL 136, ENGL 136T, ENGL 137T, ETST 114, ETST 170/ WRLT 170, LNST 120/SPN 120C, LNST 153/ ETST 153, SPN 102B, SPN 111F, SPN 111W, SPN 121E, SPN 122A, SPN 145, SPN 165, SPN 170(E-Z), SPN 172, SPN 188(E-Z), PORT 162(E-Z), RLST 138
6. Arts, Media, and Performance Studies: AHS 112, AHS 113, AHS 115/LNST 115, DNCE 130, DNCE 132, DNCE 135, ETST 154, FVC 125(E-Z)/SPN 125(E-Z)/LNST 125(E-Z), FVC 171/SPN 171, LNST 105/FVC 185/SPN 185, LNST 109/FVC 179/SPN 179/GSST 179, MUS 113, MUS 115, MUS 122, MUS 174, MUS 175
7. Politics: ETST 111, ETST 123, ETST 156, POSC 124 or POSC 124S, POSC 126, POSC 157, POSC 159, POSC 160, LNST 142/POSC 162, LNST 148/POSC 158, SOC 181

8. Ethnic Studies and Sociology: ETST 108(E-Z), ETST 109G, ETST 124, ETST 127, ETST 128/SOC 128, ETST 129, ETST 132, ETST 142, ETST 155, ETST 161, ETST 163/SOC 163, ETST 165/SOC 165, SOC 181

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Graduate Program

The Ph.D. Designated Emphasis (DE) in Latin American Studies fosters communication, collaboration, and exchange with scholars across many departments within the university, and at the national and international levels. Our faculty are active researchers in the social sciences, humanities and natural sciences. Students pursuing the D.E. will benefit from the prominence of the faculty combined with a range of courses and research opportunities.

Requirements

The Designated Emphasis is a rigorous course of study requiring students to demonstrate focused coursework and research in the field with three core requirements:

1. The program requires the completion of 4 graduate courses or 16 units (with at least one of these courses emphasizing U.S.-Latino experience and at least two with a primary axis of Mexico, Central American, South America, or the Caribbean). These courses must be taken in at least two different department and will be selected from the list below. Courses used to satisfy departmental Ph.D. requirements may not be applied to the D.E. (although courses taken within the student's home department not required for the Ph.D. may be applied). The GPA for coursework cannot be below a 3.0.
2. The program also requires the submission of a research portfolio within one year after the quarter in which the student files for candidacy. The portfolio, to be reviewed by a standing committee of LAS faculty, will demonstrate significant research in the field, include two research papers and syllabi from the four courses accompanied by an introductory self-statement (of no more than 1000 words) articulating the particular research emphasis and its depth and breadth of engagement with the field along with an explanation of specific expertise and emphases.
3. Finally, the program requires language certification through examination or coursework in a Latin American language: Spanish, Portuguese, Kreyol, or an indigenous language. Evidence of language certification must be included in the research portfolio (passing of a written translation exam, a full length (15pp+) research paper written in the language, or two or more years of language courses at the college or university level).

Lower-Division Courses

LNST 001 Introduction to Latin American Studies 5 Lecture, 3 hours; screening, 1.5 hours; individual study, 3 hours; term paper, 1.5 hours. Introduces key issues in Latin American Studies and how scholars from diverse fields address them. Topics include indigenous cultures; colonial history; poverty; race, gender, and class inequalities; democracy and dictatorship; revolution; and civil war. Integrates film, literature, and music into the course.

LNST 015 Latin American Folk and Popular Styles 4 Lecture, 2 hours; discussion, 1 hour. assigned listening, 3 hours. Prerequisite(s): none. Introduction to the vast array of folk and popular styles of music in Latin America, with an emphasis on cultural and ethnic interaction and exchange in the context of Latin American history, politics, and society. Cross-listed with MUS 015.

LNST 016 Latin American Classical Heritage 4 Lecture, 2 hours, discussion, 1 hour. assigned listening, 3 hours. Prerequisite(s): none. Survey of the rich heritage of Latin American classical music from Renaissance sacred polyphony to contemporary styles. Emphasis on the gradual emergence of Latin American music from European domination and the establishment of distinctive national traditions in the post-colonial era. Cross-listed with MUS 016.

LNST 017 Music of Mexico 4 Lecture, 3 hours, discussion, 1 hour; assigned listening, 1 hour. Prerequisite(s): musical training and knowledge of Spanish is useful, but not required. Covers music from 1521 to the present day. Explores the rich musical tradition of Mexico, as well as the relationship between its art and popular music. Cross-listed with MUS 017.

LNST 027 Art of Pre-Columbian America 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): none. A survey course that provides a background to the ancient art of Mexico, Central America, and the Andean region of western South America. Discusses art of pre-Columbian America according to the three broad cultural regions of Mesoamerica, the lower part of central and northwestern South America, and the Andean area. Cross-listed with AHS 027, and ANTH 027.

LNST 028 Art and Architecture of Latin America 4 Lecture, 3 hours; discussion, 1 hour; individual study, 2 hours. Introduces Latin American art and architecture from the European conquest to the present. Topics include religious and secular art and architecture; hybridization of indigenous and imported styles; national styles after independence; Mexican murals; women artists; Latin American modernismo; and Chicano and Border art. Cross-listed with AHS 028.

LNST 073A Dance of Mexico 2 Studio, 3 hours; extra reading, 1 hour; screening, 1 hour, individual studio, 1 hour. Prerequisite(s): none. Covers the traditional dances of Mexico at the beginning level. Includes attendance at dance concerts outside of class. Recommended for both nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with MUS 073A.

LNST 073B Dance of Mexico 2 Studio, 3 hours; extra reading, 1 hour; screening, 1 hour; individual studio, 1 hour. Prerequisite(s): LNST 073A/MUS 073A is recommended. Covers the traditional dances of Mexico at the beginning level. Includes attendance at dance concerts outside of class. Recommended for both nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with MUS 073B.

Upper-Division Courses

LNST 104 An Introduction to the Study of Spanish and Comparative Linguistics 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. An introduction to the study of Spanish and comparative linguistics. Cross-listed with SPN 104.

LNST 105 Imagining the Nation: Film and Media in Latin America 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Study of the role of media and film in creating a national imaginary in Latin America. Focus is on one region or nation--such as the Andes, the Caribbean, Mexico, Argentina, or Chile--relating local history to the global context. Course is repeatable as topics change to a maximum of 8 units. Cross-listed with MCS 185, and SPN 185.

LNST 106 The Phonology of the Spanish Language 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): LING 020; SPN 101A, SPN 101B or SPN 109A, SPN 109B; or consent of instructor. Provides a descriptive and normative analysis of the phonological system of the Spanish language. Focuses on the phonetic characteristics of contemporary Peninsular and Hispano-American Spanish. Cross-listed with SPN 105.

LNST 107 Spanish in the United States 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A sociolinguistic study of the Spanish language in the United States. Cross-listed with SPN 107.

LNST 109 Gender, Media, and Latin America 5 Lecture, 3 hours; screening 3 hours; research 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Explores the way Latin Americans have thought of and represented gender across a variety of media including essays, film, novel, short story, and performance. Compares the possibilities and limitations of these media for representing gender in the Latin American context. Cross-listed with MCS 179, SPN 179, and GSST 179.

LNST 112 The Art of the Aztec Empire 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): AHS 027/ANTH 027/LNST 027 or upper-division standing or consent of instructor. An introduction to the art of the Aztec Empire. Studies architecture, sculpture, ceramics, painting, lapidary work, gold work, and feather work. Explores the relationship between art and ritual and art and the imperial state. Cross-listed with AHS 112 and ANTH 151.

LNST 114 History of Brazilian Art & Architecture 4 Lecture, 3 hours; outside research, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. The history of Brazilian art and architecture from the nineteenth century to present. Explores visual culture including painting, sculpture, prints, murals, architecture, urbanism, landscape design, and installation art. Studies artworks and buildings through a social historical framework, taking into consideration topics like colonialism, modernization, underdevelopment, race, nationalism, internationalism, and globalism. Cross-listed with AHS 114.

LNST 115 Modern and Contemporary Art of Latin America 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. A study of Latin American art from circa 1900 to the present. Considers national and regional histories and artistic trajectories beginning with the advent of an artistic avant-garde. Investigates the relationships between European and Latin American developments. Cross-listed with AHS 115.

LNST 116 Architecture and Arts of the Andes 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. An introduction to architecture, urbanism, and related material culture of the Andes from ancient times to the present. Focuses on the diverse and rich architectural heritage of an important building center in the Americas. Addresses architecture's relationship to artistic and material production such as painting, pottery, sculpture, city planning, and textiles. Cross-listed with AHS 116.

LNST 117 Visual Culture of the Incas 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the art, architecture, and urban form of the Inca civilization. Examines how these elements influenced state formation, conquest, and resistance. Includes studies of urban plans, buildings, paintings, textiles, prints, sculpture, metalwork, and ceramics. Cross-listed with ANTH 157, and AHS 117.

LNST 120 Major Topics in Hispanic Literature: Latin America 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SPN 110. Reading and analysis of major texts of authors from Latin America. Cross-listed with SPN 120C.

LNST 124 Conceptual Art in Latin America 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Considers conceptual art made across Latin America, from 1960s to present. Focuses on subversive strategies artists developed to critique military dictatorships then in power, while circumventing legalized censorship. Considers localized versions of conceptual art in Santiago, Buenos Aires, Rio de Janeiro, Havana, Mexico City, and situate them within international movement. Cross-listed with AHS 124.

LNST 125 (E-Z) Topics in Latin American Film and Media 5 Lecture, 3 hours; extra reading, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Intensive formal, historical, and theoretical analysis of a theme or issue in Latin American film and media. Cross-listed with MCS 125 (E-Z), and SPN 125 (E-Z).

LNST 129A Introduction to Maya Hieroglyphs 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or ANTH 005 or ANTH 007 or ANTH 007S; or consent of instructor. Introduces the Maya hieroglyphs and critically evaluates its political history. Topics include three Maya calendars, a basic grammar (logographs, syllables, verbs, pronouns), three writing methods (transcriptions, transliteration, and translation), dynastic events, gods, supernaturals, and political interactions. Cross-listed with ANTH 129A, and CPAC 129A.

LNST 129B The Linguistics of Ancient Maya Writing 4 Lecture, 3 hours; extra reading, 2 hours; research, 3 hours; term paper, 1 hour. Prerequisite(s): ANTH 129A; or consent of instructor. Analyzes and critically evaluates the linguistics of Ancient Maya Writing. Topics include grammar (transitive, intransitive, positional, active, passive, mediopassive, antipassive, inchoactive verbs, tense, aspect, transitive perfect, noun, pronoun, morphosyllable, phonology); three writing methods (transcriptions, transliteration, and translation); title and rank; scripts and ideologies; and dynastic interactions. Cross-listed with ANTH 129B, and CPAC 129B.

LNST 142 Latin America: the Quest For Development and Democracy 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A comparative examination of central issues in and components of Latin American political life. Covers economic development, regimes and alliances, guerrilla wars, the armed forces, human rights, and democratic consolidation. Includes Argentina, Chile, Venezuela, and Peru. Cross-listed with POSC 162. Credit is awarded for one of the following POSC 162, LNST 142, LNST 142S, or POSC 162S.

LNST 142S Latin America: the Quest For Development and Democracy 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. A comparative examination of central issues in and components of Latin American political life. Covers economic development, regimes and alliances, guerrilla wars, the armed forces, human rights, and democratic consolidation. Includes Argentina, Chile, Venezuela, and Peru. Cross-listed with POSC 162S. Credit is awarded for one of the following POSC 162S, LNST 142S, LNST 142, or POSC 162.

LNST 147 Borderlands History of the United States 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the frontier in U.S. history focusing on the Western frontier and Spanish borderlands. Cross-listed with HISA 137.

LNST 148 Politics of Mexico 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A survey of contemporary Mexican politics. Emphasis is on recent economic and social changes and their impact on Mexico's political system. Topics include relations with the United States, the rise of drug trafficking in Mexico, and the recent emergence of opposition politics. Cross-listed with POSC 158.

LNST 168 Caribbean Culture and Society 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An overview of the Caribbean region from a historical, cultural, and political perspective. Emphasizes contemporary issues affecting the Caribbean and the struggle of its people to maintain their identities. Cross-listed with ANTH 142G, and ETST 148.

LNST 170 Colonial Latin America 4 Lecture, 3 hours; extra reading; 2 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A history of Latin America from pre-Columbian times to independence with an emphasis upon selected themes concerning the social, economic, and cultural aspects of colonialism. Cross-listed with HISA 160.

LNST 171 Nineteenth-Century Latin America 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics include the breakdown of political order and the problem of the nation-state, liberalism and conservatism, slavery and abolition, foreign intervention and capital investment, the reemergence of political order in the Age of Liberalism (1860-1900), and social and cultural change. Cross-listed with HISA 161.

LNST 172 Twentieth-Century Latin America 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Topics include the Mexican Revolution, the Great Depression, populism, industrialization, revolution, and the

emergence of conservative regimes in the age of neoliberalism. Cross-listed with HISA 162.

LNST 185 Economic Development in Latin America 4 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 103 or ECON 104A or ECON 105A. A comparative analysis of the major trends in Latin American economies in the twentieth century. Includes historical legacies, primary export economies, the theory and practice of import substitution industrialization, and the debt crisis. Also covers stabilization and structural adjustment, poverty and income distribution, the informal and agricultural sectors, and the environment. Cross-listed with ECON 185.

LNST 187 Contemporary Public Policy Challenges in Latin America 4 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): ECON 002 or ECON 002H; ECON 003 or ECON 003H; or consent of instructor. A survey of the wide-sweeping policy reforms since the 1980s and of contemporary public policy challenges in Latin America. Challenges discussed include extremely high levels of poverty and inequality; inadequate educational and healthcare systems; pressures for land reform; problems of trade competitiveness; and recurring currency crises. Cross-listed with ECON 187.

LNST 188 United States and Latin American Relations 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores international relations between the United States and the nations of Latin America. Examines different theories for explaining changes in the conduct of U.S.-Latin American relations over time. Topics include democracy and empire, revolution and counter-insurgency, economic integration and trade, petroleum politics, drug trafficking, and migration flows. Cross-listed with POSC 161.

LNST 189 Economic Development in Brazil 4 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A; ECON 103 or ECON 105A. An analysis of the successes and failures of economic development in the largest country in Latin America. Reviews current issues facing Brazilian policy makers. Topics include historical legacies, import substitution and industrialization, poverty and inequality, agriculture and land reform, and the environmental impact of development. Cross-listed with ECON 189.

LNST 190 Special Studies 1 to 5 Consent of the instructor and the Latin American Studies Committee required.

Law and Society

Subject abbreviation: LWSO
College of Humanities, Arts, and Social Sciences

Piotr Gorecki, Ph.D., Chair
Committee Office, 1604 Humanities and Social Sciences
(951) 827-5208

Committee in Charge

Piotr Gorecki, Chair (History)
John Cioffi (Political Science)
Carl Cranor (Philosophy)
Paul Green (Ethnic Studies)
Alexander Haskell (History)
Fariba Zarinebaf (History)
Daryle Williams, Dean, *ex officio*

Professors Emeriti

David Eastmond (Neuroscience)
Robert Parker (Sociology)
Georgia Warnke (Philosophy)

Major

The Law and Society major is open to undergraduate students with junior standing who have completed LWSO 100 with a grade of "C" or higher. The major offers an interdisciplinary liberal arts approach to the study of legal and law-like relationships and institutions. The program combines the perspectives of various disciplines in the Humanities and Social Sciences. The multidisciplinary approach introduces students to a wider range of views about law than is generally possible within a single department, provides a coherent and rigorous program of courses organized around the theme of law and law-like relationships, and allows students to develop critical thinking about law and social institutions.

For students not planning to pursue graduate studies, this program offers a means of understanding some complex relationships between social institutions. For those who plan to pursue graduate studies, the breadth of course work should provide a sound basis for graduate studies in areas related to law: history, philosophy, political science, and sociology, among others. And for students who choose to pursue the study of law in a professional school of law, the curriculum can offer a sound background.

Students may select Law and Society as a major with the departments of Anthropology, Economics, History, Philosophy, Political Science, Psychology, and Sociology.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The major requirements for the B.A. degree in Law and Society are as follows:

1. Specified requirements of the cooperating department (See the departments of Anthropology, Economics, History, Philosophy, Political Science, Psychology, or Sociology.)
2. **Law and Society requirements** (36 units)
   a) PHIL 007 or PHIL 007H
   b) LWSO 100 (with a grade of "C" or better)
   c) One course chosen from POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
   d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
   e) Two courses chosen from HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180
   f) LWSO 193, Senior Seminar

Note

For sections 2.d) and 2.e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (specified departmental requirements and Law and Society requirements).

Minor

The minor in Law and Society has the following requirements.

1. Upper Division (six courses [at least 24 units])
   a) LWSO 100
   b) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
   c) Two courses chosen from HISA 120A, HISA 120B, HISE 123, PHIL 164, LWSO 175 (E-Z), POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Upper-Division Courses

LWSO 100 Introduction to the Study of Law and Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An introduction to the interdisciplinary study of the role of law and legal institutions in society. Examines the role of criminal, tort, contract, constitutional, or other areas of the law in society from different disciplinary perspectives. Credit is awarded for one of the following LWSO 100 or LWSO 100H.

LWSO 100H Honors Introduction to the Study of Law and Society 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Honors course corresponding to LWSO 100. An introduction to the interdisciplinary study of the role of law and legal institutions in society. Examines the role of criminal, tort, contract, constitutional, or other areas of the law in society from

different disciplinary perspectives. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of LWSO 100 or LWSO 100H.

LWSO 175 (E-Z) Topics in Law and Society 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): LWSO 100 or LWSO 100H. Addresses current topics in law and society.

LWSO 175E Convicting the Innocent 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): LWSO 100 or LWSO 100H; upper-division standing. Considers the causes of false convictions.

LWSO 180A Symposium in the Law 1 Seminar, 10 hours per quarter. Prerequisite(s): upper-division standing; consent of instructor in the preceding quarter. A discussion of legal matters of common interest, in conjunction with experts from outside the university. After completing LWSO 180A, LWSO 180B, and LWSO 180C, students may repeat the sequence once for credit; total credit for each course may not exceed 2 units.

LWSO 180B Symposium in the Law 1 Seminar, 10 hours per quarter. Prerequisite(s): LWSO 180A. A discussion of legal matters of common interest, in conjunction with experts from outside the university. After completing LWSO 180A, LWSO 180B, and LWSO 180C, students may repeat the sequence once for credit; total credit for each course may not exceed 2 units.

LWSO 180C Symposium in the Law 1 Seminar, 10 hours per quarter. Prerequisite(s): LWSO 180B. A discussion of legal matters of common interest, in conjunction with experts from outside the university. Graded Satisfactory (S) or No Credit (NC). After completing LWSO 180A, LWSO 180B, and LWSO 180C, students may repeat the sequence once for credit; total credit for each course may not exceed 2 units.

LWSO 192 Science and Law 4 Lecture, 3 hours; extra reading, 1 hour; outside research, 1 hour; term paper, 1 hour. Prerequisite(s): LWSO 100 or LWSO 100H. Discusses the intersection between science and law. Also compares legal and scientific procedures and decision making.

LWSO 193 Senior Seminar in Law and Society 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): LWSO 100 or LWSO 100H; senior standing in Law and Society/Anthropology, Law and Society/Economics, Law and Society/History, Law and Society/Philosophy, Law and Society/Political Science, Law and Society/Psychology, or Law and Society/Sociology. Aims to synthesize multidisciplinary perspectives and knowledge provided by other courses in the Law and Society Program through readings, group discussion, and research on an issue or problem in law and society. Covers topics such as law and morality, law and social change, law and religion, and law and culture. Satisfactory (S) or No Credit (NC) grading is not available.

LWSO 198I Individual Internship in Law and Society 4 to 8 Consultation, 1 to 2 hours; term paper, 3 to 6 hours; internship, 8 to 16 hours. Prerequisite(s): LWSO 100 or LWSO 100H; consent of instructor and department chair; upper-division standing. An individual internship in the professional legal or policy-making community. Requires a substantive paper relating the internship to the student's area of study.

Liberal Studies

Subject abbreviation: LBST
College of Humanities, Arts, and Social Sciences

Heidi Brayman, Ph.D., Co-Director
Stephen James, MPhil, Ph.D., Co-Director
liberalstudies.ucr.edu

For advising questions:
chassmajorsadvising.ucr.edu

Advisory Council

Heidi Brayman, Chair (English)
Marissa Brookes (Political Science)
Holly Adams Easley (Academic Advising)
Adam Harmer (Philosophy)
Stephen James (Liberal Studies & Anthropology)
Cathy Lussier (Learning and Behavioral Sciences)
Daryle Williams, Dean, *ex officio*

Major

Liberal Studies is the major of choice for students seeking a broad liberal arts education in the humanities, arts, and social sciences. The flexibility of the requirements allows students to tailor the major to their interests across multiple disciplines, as they prepare for graduate study and careers in education, law, business, and medicine. For students planning on teaching careers in elementary education, a core of lower-division courses provides broad subject matter coverage, and upper-division work includes Education courses.

For information about undergraduate requirements, contact the LBST Advisors at chassmajorsadvising.ucr.edu. Information about UCR's credential programs can be found at the School of Education website, education.ucr.edu/teach or at 1124 Sproul Hall.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The major requirements for the B.A. degree in Liberal Studies are as follows:

1. Lower-division requirements (12 courses [at least 48 units]). Courses can be used to fulfill college breadth requirements.
   a) Science and Mathematics (4 courses [at least 16 units]) from: BIOL, CHEM, CS, GEO, MATH, or PHYS.
   b) Humanities and Fine Arts (4 courses [at least 16 units]) from: ART, AHS, CPLT, CRWT, DNCE, ENGL, LING, MUS, PHIL, or TFDP.
   c) History and Social Sciences (4 courses [at least 16 units]) from: ANTH, ECON, ETST, GBST, GSST, HIST, MCS, POSC, PSYC, RLST, or SOC.
2. Upper-division requirements: 10 courses (at least 40 units).
   a) One writing course from: ENGL 103 or CRWT 130.
   b) One course in American/European Literature or Arts, not to include language study, from: ART, AHS, CLA, CPAC, CPLT, DNCE, ENGL, EUR, FREN, GER, ITAL, LATN, LNST, MUS, MCS, PHIL, PORT, RUSN, SPN, or TFDP.
   c) One course in non-Western Literature or Arts or Gender Studies, not to include language study, from: AHS, ART, ARLC, AST, CHN, CPLT, DNCE, ETST, GSST, JPN, KOR, MCS, MUS, PHIL, SEAS, TFDP, or VNM.
   d) One course in U.S. History or Government/Politics, Economics, or Society from: ANTH, ECON, HIST, POSC, or SOC.
   e) One course in Communications or Technology from: ANTH, AHS, ART, CPLT, CS, ECON, ENGL, ETST, GSST, MCS, PHIL, SOC, or TFDP.
   f) One course with a Global Perspective from: AHS, ANTH, ECON, ETST, GBST, GSST, HIST, LNST, PHIL, POSC, RLST, or SOC.
   g) Three additional upper-division courses offered in the College of Arts and Social Sciences OR for pre-teaching credential students, three from the following: EDUC 132, EDUC 147, EDUC 162, EDUC 171 or 172, EDUC 177 or 178, EDUC 179A.
   h) Liberal Studies Capstone Course: LBST 191 or LBST 190
3. Exit Portfolio: Students will compile at least three pieces of written work from upper-division courses, one of which must specifically address research methodology, broadly understood, and evidence of applied research or work experience – e.g., a fourth paper, journal/report from an internship or experiential learning exercise, or, for pre-teaching credential students, a record of classroom experience.

Lower-Division Courses

LBST 001 Introduction to Liberal Studies 5 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Introduces the richness of the Liberal Studies tradition. Incorporates approaches and integrates learning from the Natural Sciences, Social Sciences, and Arts and Humanities.

LBST 020W Writing Across the Disciplines in Liberal Studies 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours; extra reading, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 040V; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Develops expository and analytical writing skills. Explores the varying expectations, forms, and objectives across the range of disciplines incorporated in the Liberal Studies major. Focuses on multi- and interdisciplinary writing to prepare for upper-division courses offered in the College of Humanities and Social Sciences. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that

the student's college permits as alternatives to WRIT 030.

Upper-Division Courses

LBST 190 Special Studies 1 to 5 Individual Study, 2 to 10 hours; written work, .5 to 2.5 hours; tutorial, .5 to 2.5 hours. Prerequisite(s): upper-division standing or consent of instructor. Includes preparation of a written proposal endorsed by a supervising instructor as a means of meeting individual curricular needs.

LBST 191 Seminar in Liberal Studies 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Facilitates student efforts to bring together the knowledge, skills, and interests developed to this point through all aspects of their education. Includes a paper or project and completion of an e-portfolio.



Management

Subject abbreviation: MGT
The A. Gary Anderson Graduate School of Management

Yunzeng Wang, Ph.D. *Dean*
Thomas Kramer, Ph.D. *Associate Dean for the Academic Undergraduate Programs*
Rami Zwick, Ph.D., *Associate Dean for the Academic Graduate Programs*
School Office, School of Business 4th Floor
(951) 827-6329; agsm.ucr.edu

Professors

Subramanian 'Bala' Balachander, Ph.D. *Albert O. Steffey Chair* (Marketing)
Margaret Campbell, Ph.D. *Associate Dean, Department Chair, and A. Gary Anderson Family Foundation Endowed Presidential Chair*(Marketing)
Hai Che, Ph.D. (Marketing)
Y. Peter Chung, Ph.D. (Finance)
Long Gao, Ph.D. (Operations and Supply Chain Management)
Mohsen El-Hafsi, Ph.D. (Operations and Supply Chain Management)
Elodie Goodman, Ph.D. *Logistics Team Presidential Chair in Supply Chain Management* (Operation and Supply Chain Management)
Jerayr 'John' Haleblian, Ph.D.*A. Gary Anderson Family Foundation Endowed Presidential Chair in Business Administration* (Management)
Jean Helwege, Ph.D. *Philip L. Boyd Endowed Chair in Finance* (Finance)
Thomas Kramer, Ph.D. *Associate Dean for the Academic Undergraduate Programs and A. Gary Anderson Family Foundation Endowed Presidential Chairs in Business Administration* (Marketing)
Birendra Mishra, Ph.D. (Accounting)
Ashutosh Prashd, Ph.D. (Marekting)
Richard Smith, Ph.D. *Philip L. Boyd Chair* (Finance)
Yunzeng Wang, Ph.D. *Dean's Distinguished Scholar* (Operations and Supply Chain Management)
Rami Zwick, Ph.D. *Associate Dean for the Academic Graduate Programs* (Marketing)
Ivy Zhang, Ph.D. (Accounting and Information Systems)

Professors Emeriti

Bajis M. Dodin, Ph.D. (Operations and Supply Chain Management)
Woody Liao, Ph.D. (Accounting)
Theodore Mock, Ph.D. *Distinguished Professor* (Accounting)
Kathleen Montgomery, Ph.D. *Distinguished Professor* (Management)
Michael Moore, Ph.D. (Accounting)
Waymond Rodgers, Ph.D. (Accounting and Information Systems)
Richard Smith, Ph.D. (Finance)
David Stewart, Ph.D. *Distinguished Professor* (Marketing)

Associate Professors

Alexander Barinov, Ph.D. (Finance)
Richard Carrizosa, Ph.D. (Accounting)
Michael Haselhuhn, Ph.D. (Management)
Hyun 'Shana' Hong, Ph.D. (Accounting)
Yawen Jiao, Ph.D. (Finance)
Mingyu 'Max' Joo, Ph.D. (Marketing)
Ye Li, Ph.D. (Management)
Boris Maciejovsky, Ph.D. (Management)
Adem Orsdemir, Ph.D. (Operations and Supply Chain Management)
Marlo Raveendran, Ph.D. (Management)
Ashish Sood, Ph.D. (Marketing)
Danko Turcic, Ph.D. (Operations and Supply Chain Management)
Elaine Wong, Ph.D. (Management)

Associate Professor of Teaching

Greg Richey (Finance)

Assistant Professors

Eric Allen, Ph.D. (Accounting)
Mengmeng Dong, Ph.D. (Finance)
Scott Ganz (Management)
Hyeik Kim (Finance)
Demetrius Lewis (Management)
Mindy Truong (Management)
Aruhn Venkat (Accounting)
**

Assistant Professors of Teaching

Kyle Ingram (Management)
Jonathan Lim (Marketing)
Sanjoy Moulik (Information Systems)
Rich Yueh (Information Systems)

Lecturers

Arturo Alcaraz (Management)
Daniel Almendarez (Accounting)
Suri Gurumurthi (Operations and Supply Chain Management)
Sean Jasso (Management and Marketing)
Hoyul Paik (Finance)
Jonathan Pittard (Accounting)
Raj Singh (Management)
Kan Wang (Information Systems)

Graduate Programs

The A. Gary Anderson Graduate School of Management offers a variety of programs leading to the M.B.A. (Master of Business Administration) degree. These include a two-year, full-time M.B.A. program, and a Professional M.B.A. (PMBA) program, which may be completed in 27- 33 months. AGSM also offers a Master of Professional Accountancy (M.P.Ac.) and a Master of Finance (M.Fin.). The Ph.D. Program in Business Administration offers the Doctor of Philosophy Degree (Ph.D.). In limited circumstances, students in the Ph.D. Program may be awarded a degree (the Master of Arts (M.A.) in Management should they fail to complete their doctoral studies.

Master of Business Administration

Applications for the full-time M.B.A. program are accepted for fall, winter, and spring entry. The program is open to eligible students from all undergraduate majors. Quantitative methods (business calculus, statistics, and linear algebra) is a prerequisite to the program. Qualified students who have not taken this prerequisite course may be admitted, but must meet this requirement during their first two quarters in residence.

Admission to the full-time MBA program is made based on a holistic assessment of the applicant's background and achievements, including academic preparedness (mandatory undergraduate GPA and optional GMAT/GRE scores), professional and/or academic experiences including extra-curricular activities, recommenders' opinions and supporting evidence, written and oral communication, leadership potential, overcoming adversity and contributions to diversity.

Although submitting GMAT/GRE score is optional, a superior GMAT/GRE score may help offset weakness in other evidence of academic preparation and can enhance funding considerations. Not submitting GMAT/GRE score does not reduce an applicant's chances of being admitted if their GPA is 3.0 or better.

Applicants whose first language is not English are required to submit acceptable scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System.

All other application requirements are specified in the graduate application or in the General UCR catalog.

Masters of Business Administration Course Work

The M.B.A. program can be completed in two years on a full-time basis or in three to four years on a part-time basis. In the 80-unit program (20 courses), all students take 36 units in a common body of knowledge that consists of courses in quantitative analysis, managerial economics, financial accounting, finance, operations and management science, information systems, organizational behavior and theory, strategic management, and marketing management. Thereafter, students complete a required internship, 28-36 units selected from electives, a management synthesis course, and a thesis or an industry-based case project (in the management synthesis class MGT 238).

Electives are selected with the assistance of a faculty advisor to meet individual educational and career goals. Electives are offered in areas such as accounting, entrepreneurial management, finance, human resources management, international management, management science, management information systems, marketing, and production and operations management. The program is flexible to meet individual student interests, and students are also encouraged to take courses in related disciplines such as economics, statistics, computer science, and sociology.

Prerequisite Requirement:

Students without a quantitative background are required to complete a quantitative review. This can be done through an external quantitative review or through completion of MGT 403: Review of Quantitative Methods for Management. If students choose to do the external review; this must be completed prior to, and no later than one week before their MBA program begins. AGSM will provide recommendations for external review programs at the point of admission.

Choosing a concentration is optional. Students who chose to specialize in a second concentration has to take 40 units of electives courses. They have to complete additional 4 units beyond the 36 units required for graduation.

Degree Requirements:

1. **Prerequisite Requirement:** Students without a quantitative background are required to complete an external quantitative review program prior to, or during, their MBA program. AGSM will provide recommendations for review programs at the point of admission
2. **Professional Workshops (2 units)**
   a. Full Time MBA Students Only:
   MGT 402 Business Career Professional Development Workshop
3. **Common Body of Knowledge (36 units)**
   a. MGT 200 Organizational Behavior and Theory
   b. MGT 201 Quantitative Analysis
   c. MGT 202 Financial Management
   d. MGT 203 Economics for Management
   e. MGT 205 Information Systems
   f. MGT 207 Operations Management for Competitive Advantage
   g. MGT 209 Marketing Management
   h. MGT 211 Financial Accounting
   i. MGT 235 Strategic Management
4. **Fieldwork in Management (4 units)** – MGT 298i
5. **Electives Courses and Concentration:** Students are required to complete at least 28 units of electives for the thesis option and 36 units for the comprehensive exam (MGT 238) option. Students may choose to focus their elective courses such that they complete one or more concentrations in Accounting, Business Analytics, Finance, Information Systems, Management, Marketing, or Operations and Supply Chain Management (OSCM). Students who choose to specialize in a second concentration must take an additional 4 units beyond the 36 units required for graduation (comprehensive exam option). Each concentration consists of five courses as follows:

Accounting:

Choose five courses from the seven courses below:

MGT 204 Cost and Management Accounting
MGT 225 Professional & Forensic
MGT 226 Fraud and Forensic Auditing
MGT 229 Accounting Ethics & Professional Responsibilities
MGT 240A Taxation
MGT 240B Advance Taxation
MGT 241 Accounting Systems and Control
MGT 245 Financial Statement Analysis
MGT 277 Advanced Financial Accounting
MGT 278A Foundations of Auditing and Assurance Services
MGT 278B Information Technology & Auditing Assurance
MGT 278C Internal Auditing

Business Analytics:

The concentration consists of two required courses and three elective courses:

Required Courses:

MGT 251 Marketing Analytics
MGT 256 Business Analytics for Management

Elective Courses:

MGT 219 Spreadsheet Modeling for Decision Making
MGT 230 Databases for Management
MGT 233 Marketing Research
MGT 239 Simulation for Business
MGT 267 Applied Business Forecasting

Finance:

The concentration consists of three required courses and two elective courses:

Required Finance Courses:

MGT 227 Fixed-Income Securities and Markets
MGT 231 Corporate Finance
MGT 252 Investments and Portfolio Management

Elective Finance Courses:

MGT 213 Trading Strategies and Financial Models
MGT 232 Derivatives and Asset Pricing
MGT 237 International Financial Management
MGT 244 Corporate Risk Management
MGT 268 Entrepreneurial Finance and Venture Capital
MGT 274 Special Topics in Finance
MGT 276 Financial Strategy and Corporate Control
MGT 295F Seminars in Finance: Empirical Methods in Finance
MGT 295G Seminars in Finance: Corporate Finance

Information Systems:

Choose five courses from the nine courses below:

MGT 230 Database for Management
MGT 239 Business Modeling and Simulation
MGT 241 Accounting Systems and Control
MGT 256 Business Analytics for Management
MGT 264 Information Systems Resource Management
MGT 278B Information Technology Auditing and Assurance
MGT 280 Business Issues in Electronic Commerce
MGT 281 System Analysis and Design
MGT 282 Business Data Communication

Management:
Choose five courses from nine courses below:

MGT 210	Human Resources Management
MGT 212	Application of Behavioral Economics to Management, Decision- Making, and Policy
MGT 214	Corporate Strategy
MGT 215	International Comparative Management
MGT 216	Managerial Decision Making
MGT 218	Ethics in Management
MGT 220	Negotiation for Managers
MGT 222	Strategic Organization Change
MGT 246	Entrepreneurial Management
MGT 272	Global Strategy & Management

Marketing:
Choose five courses from eight courses below:

MGT 228	Consumer Behavior
MGT 233	Marketing Research
MGT 234	Brand Management
MGT 242	Global Marketing Management
MGT 243	Entrepreneurial Marketing
MGT 247	Advertising and Sales Promotion Management
MGT 248	New Product Development
MGT 249	Pricing Strategy
MGT 250	Marketing Channels and Sales Force
MGT 251	Marketing Analytics
MGT 253	Digital Marketing
MGT 254	Internet Retailing Project
MGT 257	Marketing Strategy

OSCM:
Must complete five courses from the list below.

MGT 219	Spreadsheet Modeling for Decision-Making
MGT 221	Decision Making Under Uncertainty
MGT 239	Business Modeling and Simulation
MGT 256	Business Analytics for Management
MGT 258	Logistics and Supply Chain Management
MGT 266	Project Management
MGT 267	Applied Business Forecasting

Normative Time to Degree
7 quarters - M.B.A.; 6 quarters - M.Fin. and M.P.Ac. 15 quarters – Ph.D.

Masters of Business Administration

Candidates for the M.B.A. are required to complete all the general requirements specified in the Graduate Studies section of this catalog.

The program conforms to Plan I or Plan II.

Plan I (Thesis)
For thesis work, a maximum of 8 units of credit is granted. The thesis is a two or more quarter research endeavor to be initiated during a student's final year in the program. It is expected that most students will develop theses related to advanced work in their electives. The format and other details of the thesis must meet the requirements of the Graduate Division of UCR.

Plan II (Comprehensive Examination)
Students who elect Plan II must complete an industry-based group case analysis as part of the management synthesis course. This case serves in lieu of a comprehensive final examination. Students whose case analyses are deemed "not acceptable" are given one additional quarter to revise them to an "acceptable" level.

Professional M.B.A.

The **Professional M.B.A. program** provides an M.B.A. experience tailored according to one's schedule. It allows flexibility and convenience in attaining one of the most sought-after degrees. The Professional M.B.A. is the program of choice for a broad swath of students. Among them might be full-time students who want to earn an M.B.A. on a fast track or who seek to take longer with their studies, international students looking for an M.B.A. at a top university, working professionals seeking a graduate degree without interrupting their careers, or individuals who need to accommodate responsibilities at home and with family as they pursue their academic goals.

Professional Master of Business Administration Program (Professional M.B.A.) Track-1

The Professional M.B.A. program Track-1 (or PMBA) provides emerging managers an opportunity to earn an M.B.A. degree with minimal disruption to their professional lives. The PMBA Track 1 curriculum matches the Full Time MBA curriculum, but students have the option to attend classes on weeknights and weekends during the program. Additionally, students in the PMBA Track 1 program are exempt from MGT 402.

The Professional M.B.A. program admits new students for enrollment in fall, winter, or spring.

Further information may be obtained by contacting the University of California, Riverside, Professional M.B.A. Program Office.

Students interested in pursuing the PMBA degree must have earned a BA, or its equivalent, with training comparable to that provided by the University of California. Evaluation of the applicant's file for admission to the Professional M.B.A. degree program is similar to that of the full-time M.B.A. program and will consist of an integrated assessment of all materials (test scores, transcripts of previous academic work, essays, and letter(s) of recommendation).

No specific undergraduate major or course work is required for admission, though preparation in quantitative methods (such as calculus and statistics) is strongly encouraged. Students who do not have adequate quantitative preparation at the time of admission will need to complete preparatory coursework in mathematics in addition to the courses required for the degree.

Admission to the PMBA program is made based on a holistic assessment of the applicant's background and achievements, including academic preparedness (mandatory undergraduate GPA and optional GMAT/GRE scores), professional and/or academic experiences including extra-curricular activities, recommenders' opinions and supporting evidence, written and oral communication, leadership potential, overcoming adversity and contributions to diversity.

Although submitting GMAT/GRE score is optional, a superior GMAT/GRE score may help offset weakness in other evidence of academic preparation and can enhance funding considerations. Not submitting GMAT/GRE score does not reduce an applicant's chances of being admitted if their GPA is 3.0 or better.

Applicants whose first language is not English are required to submit acceptable scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System.

Applicants must submit at least one letter of recommendation from individuals who can attest to their professional and leadership skills and to their potential for business leadership.

All other application requirements are specified in the graduate application or in the General UCR catalog.

Normative time
27-33 months

Further information may be obtained by contacting the Graduate Programs Office at the School of Business.

Professional Master of Business Administration Program (Professional M.B.A.) Track-2

The Professional M.B.A. Program Track-2 will provide a more efficient path way to earn an MBA for undergraduate students, as well as graduates from other schools. The proposed program will be available to students in all 4+1 and 2+ 1 programs (BS/ MBA, BA/MBA, MD/MBA, MS/MBA, MA/MBA) as well as for professionals with at least 3 years of work experience, and students from any other special programs created in future.

Admissions: The admission criteria for Track 2 is the same as the criteria for Track 1.

Course Work
The Professional MBA Track 2 is a 64 units degree consisting of 36 units of core courses, 20 units of elective courses, a 4 unit required internship course, and 4 units of a capstone course. To continue in the program students must maintain a minimum cumulative GPA of 3.0.

The curriculum includes the following components:

1. **Common Body of Knowledge (36 units)**
   a. MGT 200 Organizational Behavior and Theory
   b. MGT 201 Quantitative Analysis
   c. MGT 202 Financial Management
   d. MGT 203 Economics for Management
   e. MGT 205 Information Systems
   f. MGT 207 Operations Management for Competitive Advantage
   g. MGT 209 Marketing Management
   h. MGT 211 Financial Accounting
   i. MGT 235 Strategic Management
2. **Elective Courses (20 units)**
   a. Students will complete 20 units of elective courses (MGT 210, MGT 212-MGT 233, MGT 236-MGT 282, MGT 288A- 290, MGT 292-MGT 298i)
3. **Fieldwork in Management: MGT 298i (4 units)**
4. **Capstone (4 units):** Students are required to complete either Plan 1 or Plan II for the capstone requirement. See the MBA section of the catalog for more details.

Executive Master of Business Administration Program (E.M.B.A.)

The E.M.B.A. program is not currently accepting new students. For more information, contact SB's M.B.A. Program Office, 102 Anderson Hall, South; (951) 827-6200.

Applications for the Executive M.B.A. program are no longer accepted. Applications are not accepted for the M.A. in Management degree.

Master of Finance (M.Fin.)

The A. Gary Anderson Graduate School of Management offers a Master of Finance (M.Fin.) degree. The degree program consists of a full-time one-academic-year program (or its equivalent on a part-time basis).

Admission

The M.Fin. is offered as a one-year program (48 units) for graduates who hold a baccalaureate degree in a field that provides sufficient quantitative background to enable successful completion of the program. Appropriate undergraduate majors include, but are not limited to, business, engineering, mathematics, statistics, and physics, among others.

All applicants to this program must have completed a bachelor's degree or its approved equivalent from an accredited institution, and have attained an undergraduate record that satisfies the standards established by the Graduate Division and University Graduate Council. Applications are accepted for fall term.

Admission to the MFin program is made based on a holistic assessment of the applicant's background and achievements, including academic preparedness (mandatory undergraduate GPA and optional GMAT/GRE scores), professional and/or academic experiences including extra-curricular activities, recommenders' opinions and supporting evidence, written and oral communication, leadership potential, overcoming adversity and contributions to diversity.

Although submitting GMAT/GRE score is optional, a superior GMAT/GRE score may help offset weakness in other evidence of academic preparation and can enhance funding considerations. Not submitting GMAT/GRE score does not reduce an applicant's chances of being admitted if their GPA is 3.0 or better.

Applicants whose first language is not English are required to submit acceptable scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) unless they have a degree from an institution where English is the exclusive language of instruction. Additionally, each applicant must submit at least one letter of recommendation. All other application requirements are specified in the graduate application or in the General UCR catalog.

Course Work

Required courses

1. MGT 201 Quantitative Analysis
2. MGT 202 Financial Management
3. MGT 211 Financial Accounting
4. MGT 227 Fixed Income Securities and Markets
5. MGT 231 Corporate Finance
6. MGT 252 Investments and Portfolio Management

Restricted elective courses currently offered to MBA students (2 of the following 7 courses)

1. MGT 213 Trading Strategies and Financial Models
2. MGT 232 Derivatives and Asset Pricing
3. MGT 237 International Financial Management
4. MGT 244 Corporate Risk Management
5. MGT 268 Entrepreneurial Finance and Venture Capital
6. MGT 274 Special Topics in Finance
7. MGT 276 Financial Strategy and Corporate Control

Required courses offered to Ph.D. and Master of Finance students

1. MGT 295F Seminar in Empirical Methods in Finance
2. MGT 295G Seminar in Corporate Finance

Other Electives

1. Students are expected to choose two electives from an extensive range of graduate courses. Recommended Finance Elective includes MGT 203: Economics for Management; However, any elective course within AGSM that is relevant to a student's educational objectives is acceptable. Courses from departments outside AGSM such as statistics and economics are also acceptable, but must be approved by the MFIN program director.

Comprehensive Exam

To receive the degree, every candidate must pass, with a grade of B- or better in each part, a written comprehensive examination. The exam is taken in two parts after completion of the two "capstone" seminar courses, MGT 295F and MGT 295G. The exam will cover the topics taught throughout the entire program. This exam will ensure that all students receiving the degree have internalized the central lessons of the degree.

Normative Time to Degree

One year

Master of Professional Accountancy (MPAc)

The Master of Professional Accountancy program provides advanced education in audit and assurance, taxation, accounting information systems and ethics. The MPAc is offered in two tracks. The first track is for graduates of a baccalaureate degree with a concentration or major in accounting and is designed to be completed in 3 to 4 quarters. The second track is for graduates of a baccalaureate degree without a concentration or major in accounting and is designed to be completed in 4 to 5 quarters.

Students can choose to pursue one of two paths within each track: with or without a required four-unit internship (MGT 298I).

All applicants to this program must have completed a bachelor's degree or its approved equivalent from an accredited institution and to have attained undergraduate record that satisfies the standards established by the Graduate Division and University Graduate Council. Applications are accepted for fall and winter terms.

Admission to the MPAc program is made based on a holistic assessment of the applicant's background and achievements, including academic preparedness (mandatory undergraduate GPA and optional GMAT/GRE scores), professional and/or academic experiences including extra-curricular activities, recommenders' opinions and supporting evidence, written and oral communication, leadership potential, overcoming adversity and contributions to diversity.

Although submitting GMAT/GRE score is optional, a superior GMAT/GRE score may help offset weakness in other evidence of academic preparation and can enhance funding considerations. Not submitting GMAT/GRE score does not reduce an applicant's chances of being admitted if their GPA is 3.0 or better.

Applicants whose first language is not English are required to submit acceptable scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) unless they have a degree from an institution where English is the exclusive language of instruction.

Additionally, each applicant must submit at least one letter of recommendation from individuals who can attest to their professional and/or academic skills. All other application requirements are specified in the graduate application or in the General UCR catalog.

Track I (no internship path) – 48 units to earn the degree.

Core Course Requirements – must complete all 6 courses for 24 units:

MGT 225	Professional Accounting and Auditing Research
MGT 229	Sustainability and Ethical Control Systems
MGT 240B	Advanced Taxation,
MGT 245	Financial Statement Analysis
MGT 278A	Auditing and Assurance Services: Theory and Practice,
MGT 278B	Information Technology Auditing and Assurance.

Elective Courses (24 units).

Restrictive Elective List. Must complete at least two courses from the list below:

MGT 226	Fraud & Forensics Auditing
MGT 277	Advanced Financial Accounting
MGT 278C	Internal Auditing

Other Elective Courses. To complete the balance of 24 elective units, students can take any other graduate courses offered by AGSM.

Track I (internship path) – 48 units to earn the degree.

Core Course Requirements – must complete all 7 courses for 28 units:

MGT 225	Professional Accounting and Auditing Research
MGT 229	Sustainability and Ethical Control Systems
MGT 240B	Advanced Taxation,
MGT 245	Financial Statement Analysis
MGT 278A	Auditing and Assurance Services: Theory and Practice,
MGT 278B	Information Technology Auditing and Assurance.
MGT 298I (4-unit). Fieldwork in Management	

Elective Courses (20 units).

Restrictive Elective List. Must complete at least two courses from the list below:

MGT 226	Fraud & Forensics Auditing
MGT 277	Advanced Financial Accounting
MGT 278C	Internal Auditing

Other Elective Courses. To complete the balance of 20 elective units, students can take any other graduate courses offered by AGSM.

Track II (no internship path) – 48 units to earn the degree.

In addition to the requirements for Track I (no internship path), students who are admitted to Track II (no internship path) of the program must complete the following courses during the first term at the program:

MGT 400A	Financial Accounting Principles and Practices I
MGT 400D	Taxation of Individuals and Business Entities

MGT 400E – Auditing and Assurance Further, students in the second track, based on their own academic and professional background, might be asked to take other preparatory courses that would ensure their success at the program.

Units earn in the MGT400 series are not for degree credit.

Track II (internship path) – 48 units to earn the degree.

In addition to the requirements for Track I (internship path), students who are admitted to Track II (internship path) of the program must complete the following courses during the first term at the program:

MGT 400A	Financial Accounting Principles and Practices I
MGT 400D	Taxation of Individuals and Business Entities

MGT 400E – Auditing and Assurance Further, students in the second track, based on their own academic and professional background, might be asked to take other preparatory courses that would ensure their success at the program.

Units earn in the MGT400 series are not for degree credit.

Plan I (Thesis) is not an option for the MPAc degree program.

Plan II (Comprehensive Examination) Plan II requires that at least 18 units be in graduate-level courses taken at a UC campus. None of these may be in courses numbered 297 or 299. To receive the degree, students must pass a comprehensive examination, the content of which is determined by AGSM faculty. The exam is taken after advancing to candidacy and at the end of all coursework. The exam will cover the topics taught throughout the entire program. This exam is designed to ensure that all students receiving the degree have internalized the central knowledge, problem solving and ethical skills necessary if they are to act as overseers of public trust.

Normative Time to Degree

3 to 5 quarters, depending on the program's track and path.

The Master of Science in Business Analytics (MSBA)

The Master of Science in Business Analytics (MSBA) program is designed to extend the training of students with analytical backgrounds in business or statistics to allow them to apply their skills to business data. Increasingly large amounts of data are available about customers, costs, and suppliers, which can be analyzed to improve operations, increase the yield on marketing programs and understand pricing and financing better, which all add to the value of the business.

The MSBA interdepartmental program is offered by the School of Business and the Department of Statistics. Depending on the curriculum track, the degree requires 48 to 49 units of study, which can be done as a full-time one-academic-year program or over a longer period on a part-time basis.

Admission

To ensure that students have the prior knowledge to succeed in the program, admission is limited to applicants who have studied statistics or another quantitative discipline such as mathematics, physics, engineering, computer science, or economics or a quantitative business discipline (such as operations, finance and marketing) as undergraduates. Applicants to the program must have completed a bachelor's degree or its approved equivalent in one of the above disciplines. Applicants who do not have an undergraduate degree in statistics or one of the quantitative business disciplines may be considered for admission if they provide sufficient evidence of appropriate training.

Applicants must have received their undergraduate degrees from an accredited institution, and have attained a record that satisfies the standards established by the Graduate Division and University Graduate Council.

All applicants must submit scores from the Graduate Management Admissions Test (GMAT) or Graduate Record Exam, General Test (GRE). Applicants whose first language is not English are required to submit acceptable scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) unless they have a degree from an institution where English is the exclusive language of instruction. Additionally, each applicant must submit at least two letters of recommendation, at least one of which must be an academic reference. All other application requirements are specified in the graduate application or in the General UCR catalog.

Course Work

Once admitted, students follow one of three tracks:

- Statistics Academic Track (48 units)
- Business Academic Track (48 units)
- Practicum Track (49 units)

The statistics academic track and the business academic track offer alternative academic preparation pathways. The practicum track augments either of those academic tracks with a one-unit internship. The statistics academic track is for students who studied a quantitative discipline other than statistics or one of the business disciplines as undergraduates (finance, operations, or marketing) and the business academic track is for students who focused on statistics as undergraduates. Students opting for the third practicum track will follow either the statistics or the business track depending on their academic background as described above, and in addition, are required to undertake an internship (MGT 298I – 1 unit) to fulfill track requirements. All tracks culminate in a two-quarter capstone class that applies their understanding of business analytics to a project.

Required courses

1. MGT 256	Business Analytics for Management
2. MGT 286A-B	Capstone in Business Analytics
3. STAT 208	Statistical Data Mining Methods
4. STAT 232	Statistics for Business Analytics

Business Academic Track (Choose any four from the following five courses):

5. MGT 202 Financial Management
6. MGT 204 Cost and Management Accounting
7. MGT 207 Operations Management
8. MGT 209 Marketing Management
9. STAT 206 Statistical Computing

Statistics Academic Track:

5. **Choose one of the following:**
   MGT 202 Financial Management ***or***
   MGT 204 Cost and Management Accounting ***or***
   MGT 207 Operations Management ***or***
   MGT 209 Marketing Management
6. MGT 219 Spreadsheet Modeling for Decision-Making ***or***
   MGT 267 Applied Business Forecasting
7. STAT 200 Foundational Methods for Business Analytics
8. STAT 206 Statistical Computing

Concentrations

Students choose a set of three courses in either marketing analytics, supply chain analytics or financial analytics. These concentration courses provide depth to the student's understanding of the area in which they will carry out a capstone course project.

Marketing Analytics (prerequisite: MGT 209):

1. MGT 251 Marketing Analytics ***and any two of the following:***
2. MGT 233 Marketing Research
3. MGT 249 Pricing Strategy
4. MGT 250 Marketing Channels and Salesforce
5. MGT 253 Digital Marketing
6. MGT 257 Marketing Strategy

Supply Chain Analytics (prerequisite: MGT 207):

1. MGT 267 Applied Business Forecasting ***or***
   MGT 219 Spreadsheet Modeling for Decision-Making
2. MGT 239 Simulation for Business
3. MGT 258 Logistics and Supply Chain Management

Financial Analytics (prerequisite: MGT 202):

1. MGT 227 Fixed Income Securities and Markets ***or***
   MGT 244 Corporate Risk Management
2. MGT 232 Derivatives and Asset Pricing
3. MGT 252 Investments and Portfolio Management ***or***
   MGT 295F Empirical Methods in Finance

Professional Development Requirement:

(a) MGT 286B gives students training in the ability to use fundamental statistical techniques to formulate problems and solutions in diverse real-world applications;

(b) the ability to use at least one statistical software package to conduct statistical data analysis;

(c) the ability to communicate with business managers about statistical data by using graphical methods in conjunction with written analysis to describe and interpret information.

Plan I (Thesis) is not an option for the MSBA degree program.

Plan II (Comprehensive Examination)

requires that at least 18 units be in graduate level courses taken at a UC campus. None of these may be in courses numbered 297 or 299. Every candidate must take a comprehensive examination, the content of which is determined by the program. Candidates for the degree are required to complete all of the general requirements specified by Graduate Studies. The program is intended to conform to Plan II.

Normative Time

One year for full-time students; Two years for part-time enrollees.

Doctoral Degree

The.Ph.D. Program in Business Administration offers the Doctor of Philosophy Degree (Ph.D.). See Ph.D. Program in Business Administration in this section of the catalog.

Ph.D. Program in Business Administration

The Ph.D. Program in Business Administration offers the Doctor of Philosophy Degree (Ph.D.). Concentrations are offered in five major field areas:

- Accounting
- Finance
- Marketing
- Operations
- Management

The Ph.D. Program in Business Administration trains doctoral students in the design and execution of original research in Management.

Admissions

Applicants will be expected to have completed a bachelor's degree at a four-year accredited college or university and to have attained an undergraduate academic record that satisfies the standards established by the Graduate Division, University of California, Riverside. In addition to the following requirements, all applicants must meet the general requirements as set forth in the Graduate Studies section of the General Catalog.

A prior business degree is not a requirement. However, if a student has no previous business coursework, he/she must consult with the Graduate Advisor about whether any coursework in the major field area will be necessary.

Applicants will be required to submit official GMAT or GRE exam scores. Preference for one exam is not given over the other. All applicants whose first language is not English must also submit an acceptable TOEFL test score prior to admittance. The successful applicant is expected to score at least 560 on the paper exam or 220 on the computer based exam, or 80 on the TOEFL iBT. Applications are accepted for admission for Fall Quarter.

Language Requirement

There is no foreign language requirement, but students who wish to TA must pass an English language proficiency exam. Students are expected to communicate their research findings in English in written and oral presentations.

Plan II (Comprehensive Examination)

The M.A. Degree, Plan II, requires the approval of the Graduate Advisor and is only available to doctoral students who are not continuing in the Ph.D. program. In addition, it requires completion of a minimum of 36 units of approved graduate-level course work and passing the comprehensive examination at least at the M.A. level. The comprehensive examination will be prepared and administered by the Graduate Examination Committee. The comprehensive examination will cover a broad range of topics chosen from the core research, major field, and elective graduate courses taken by the student in their first two years of study. Students must be in residence for 3 quarters.

UCR will not award M.A. degrees to students already possessing an M.A. in Management.

Required/Elective Courses & Required Research

- Required Research Methods Courses
- Required Field Seminars
- Other Research Courses
- Field Colloquium
- First Year Research Paper
- Professional Development Course

Each of these requirements is detailed below according to the area of concentration within the Management program. Each area requires at least 16 courses related to its field of study. In addition, some specializations require a field colloquium until the student advances to candidacy.

Required Research Methods Courses

Research methods courses are intended to provide the student with a strong foundation in research methodology. Students who wish to have courses waived must first obtain the approval of the Graduate Advisor and then the Graduate Dean. Each area's required research method courses (between five and seven, depending on the area) are as follows:

1. **Accounting**
   Students are required to take five courses from among ECON 205A-C, ECON 283E-G, PSYC 211-213, PSYC 243, PSYC 259, SOC 201A-B, SOC 203A-B, and SOC 205.
2. **Finance**
   Complete the six courses in this list: ECON 205A-C and ECON 2853E-G.
3. **Marketing**
   Students are required to take five courses from among ECON 205A-C, ECON 244, PSYC 211-213, PSYC 243, PSYC 259, SOC 201A-B, SOC 203A-B, SOC 205, STAT 200A-B, STAT 209A-B, STAT 220A-B, and STAT 230.
4. **Operations**
   Complete ECON 200A-C. In addition, complete either ECON 205A-C or STAT 201A-C

5. **Management**
   Students are required to take five courses from among ECON 205A-C, ECON 244, PSYC 211-213, PSYC 243, PSYC 259, SOC 201A-B, SOC 203A-B, SOC 205, STAT 200A-B, STAT 209A-B, STAT 220A-B, and STAT 230.

Required Field Seminars

Ph.D. students are required to complete field seminars in their major field area. The requirements for each area are as follows:

1. **Accounting**
   Students are required to take three courses from among MGT293E-Z.
2. **Finance**
   Complete the following five courses: MGT 295F-G, MGT 295I, MGT 295K and MGT 295M.
3. **Marketing**
   Complete the following three courses: MGT 288A-B, and complete either MGT 288C or MGT 288D.
4. **Operations**
   Students are required to complete three courses from among MGT 296E-Z.
5. **Management**
   Complete the following four courses: MGT 289A-D.

Other Research Courses

It is important that Ph.D. students develop a deep understanding of a basic discipline related to their major field area. Thus, students are required to complete other graduate-level courses (200 level or higher). The requirements are as follows:

1. **Accounting**
   Students are required to take three other courses from a department outside of the School of Business. This leaves five electives for the students to choose, which typically include finance courses in 295F-M.
2. **Finance**
   Students are required to take ECON200A-C and two electives.
3. **Marketing**
   Students are required to take three courses from a department outside of the School of Business. This leaves four elective courses for students to choose.
4. **Operations**
   Students are required to take seven other graduate-level courses (200 level or higher). The following courses are highly recommended: MATH 217, MATH 209A-C, MATH 228, STAT 203A-B, STAT 205, STAT 206, STAT 207, STAT 210A-B, STAT 215 ECON 244, ECON 283J, ECON 283N, EOCN 283Q, EE 231.
5. **Management**
   Students are required to take three courses from a department outside of the School of Business. This leaves four elective courses for students to choose.

Field Colloquium

It is essential that Ph.D. students actively participate in the intellectual life of the school. In particular, students are expected to attend research presentations of visiting scholars. To facilitate this, field colloquia (MGT 285) will be offered each quarter. Ph.D. students in Marketing and Management are required to take the field colloquium each quarter for course credit until they advance to Ph.D. candidacy. MGT 285 does not count as an elective in the Other Courses listed above.

First Year Research Paper

Ph.D. students must complete an original research paper at a level consistent with the quality of a rigorous Ph.D. program during their first year. The student works with the area faculty to develop the research topic, set expectations, and provide feedback. A committee consisting of the program faculty evaluates the submitted paper. Students whose paper is deemed substandard by the area faculty may be terminated from the Ph.D. program.

Professional Development Course

In order to ensure that doctoral students are prepared to enter future careers as researchers and are able to communicate their work to other researchers, students are required to take a professional development course (MGT 402). MGT 402 does not count as an elective in the Other Courses listed above.

Comprehensive Examination

The comprehensive examination serves as both a major field examination, as well as an examination of topics covered in core research courses. Subsequent to the comprehensive examination a committee of the relevant area faculty will issue a grade of passing at the Ph.D. level, passing at the M.A. level, or failing. If, in the first attempt, a student fails the comprehensive examination or passes at the M.A. level, he or she may be allowed to retake the examination. No more than two attempts to pass this exam are allowed. Students who pass only at the M.A. level may be recommended for a Master's Degree (if they do not already hold an M.A. in Management). The comprehensive exam must be taken no later than the end of the seventh quarter. Additional requirements for each concentration are as follows:.

1. **Accounting, Finance and Operations**
   The comprehensive exam contains two parts. Students first take a written part and receive a grade as outlined above. If they pass at the Ph.D. level, then they are required to take an oral exam. The grading scheme is the same for both parts, as are the rules for retakes. The written exam must be taken by the end of the seventh quarter, while the oral exam must be taken no later than the end of the eighth quarter.
2. **Marketing and Management** There are no additional requirements.

Qualifying Examination (Dissertation Proposal Defense)

When all requirements are completed, students take their oral qualifying exam, which is a defense of the dissertation proposal. Conducted by the Ph.D. Qualifying Committee, the exam is based upon the student's dissertation proposal, and includes a broad inquiry into the student's preparedness to conduct research and provides an opportunity to discuss the proposed dissertation. After completing the oral qualifying examination and all course requirements successfully, the student is formally advanced to candidacy.

The Qualifying Examination can be completed in one of the following modes: In- Person or Hybrid. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. If In-Person is chosen, the student and the entire committee must be physically present on campus for the Qualifying Examination. If Hybrid is chosen, the student and the chair of the committee must be physically present on campus for the Qualifying Examination in a video enabled room that supports some members physically present and others remote. Every effort should be made by the committee members to attend the Qualifying Examination in person, even if Hybrid is chosen.

Final Examination (Dissertation Defense)

A candidate for the degree of Ph.D. may be asked to defend his or her dissertation in a public, oral presentation at a time announced to members of the University community. Upon the candidate's successful defense of the dissertation, the Ph.D. Dissertation Committee will make a recommendation to the Graduate Division that the Ph.D. degree be conferred.

The Final Examination can be completed in one of the following modes: In-Person or Hybrid. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. If In-Person is chosen, the student and the entire committee must be physically present on campus for the Final Examination. If Hybrid is chosen, the student and the chair of the committee must be physically present on campus for the Final Examination in a video enabled room that supports some members physically present and others remote. Every effort should be made by the committee members to attend the Final Examination in person, even if Hybrid is chosen.

Dissertation

The dissertation culminates the student's academic endeavors. Of substantial magnitude, the dissertation should make a significant contribution to the advancement of knowledge in the chosen field of study. The dissertation must be filed with the Graduate Division according to their formatting requirements.

Normative time to degree

5 years

Graduate Courses

MGT 200 Organizational Behavior and Theory 4 Lecture, 3 hours; extra reading, 1.5 hours; activity, 1.5 hours. Prerequisite(s): graduate standing; or consent of instructor. Enhances understanding of complex organizational life using multiple perspectives at the micro and macro levels. Addresses theories and research pertaining to organizational structure, culture, group dynamics, interpersonal relations, and social psychological factors. Develops capabilities for diagnosing organizational problems and identifying appropriate solutions.

MGT 201 Quantitative Analysis 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): MGT 403 with a grade of S or better; or passing score on assessment test; or completing Knewton Alta prior to starting the program; or Master of Finance (MFIn); or department approval; consent of instructor; may not be taken for degree credit by students in statistics undergraduate or graduate programs; graduate

standing; or consent of instructor. Addresses decision-making and solving management problems using data. Covers the foundation of probability and statistics as well as statistical inference and interpretation of statistical analysis. Topics include probability, sampling, estimation, confidence intervals, hypothesis testing, and linear regression.

MGT 202 Financial Management 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MGT 201, may be taken concurrently; MGT 211, may be taken concurrently; graduate standing. Provides a foundation in theories of finance. Topics include time value of money, security valuation, financial institutions, theories of risk measurements, managing a firm's investment decisions, capital structure, and sources of financing for a firm.

MGT 203 Economics For Management 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MGT 403; or equivalent; graduate standing. A study of the use of microeconomics and macroeconomics in managerial decision making. Topics include demand and supply, production and cost functions, competition, labor supply, national income accounting, aggregate output, interest rates, fiscal and monetary policy, inflation, economic growth, and business cycles.

MGT 204 Cost and Management Accounting 4 Lecture, 3 hours; outside projects, 3 hours. Prerequisite(s): MGT 211 or equivalent; graduate standing. A study of accounting information for managerial planning and control. Topics include managerial applications for product costing, budgeting, and performance evaluation; accounting techniques for modern manufacturing systems; activity-based accounting and cost management; international cost accounting systems; and the behavioral implications of accounting information.

MGT 205 Information Systems 4 Lecture, 3 hours; laboratory, 1 hour; activity, 2 hours. Prerequisite(s): For the MGT 205 Online Section, Enrollment in the Executive Masters of Business Administration Program is required; graduate standing. Examines the operation and management of information systems as applied to the business environment. Topics include hardware, software, databases, decision support, and systems analysis. Software packages are used to integrate information systems concepts and business applications.

MGT 207 Operations Management For Competitive Advantage 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MGT 201; graduate standing; or consent of instructor. Focuses on managing the activities involved directly in the creation of products and services such as design, production, and distribution. Provides managers with the skills and tools to analyze, optimize, and improve production processes for competitive advantage.

MGT 208 Business, Government, and Society 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing. Provides a managerial perspective on the relationship between business and its external stakeholders. Primary focus is on the impact of public policy on business and the management of public issues in a global environment. Case studies and teamwork are emphasized.

MGT 209 Marketing Management 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Analyzes the marketing process, the environment within which it operates, institutions involved, and the functions performed. Examines the relationships and trends in a market-based economic system. Develops concepts and terms applied to marketing decisions from the perspective of a manager.

MGT 210 Human Resources Management 4 Lecture, 3 hours; outside projects and reading, 3 hours. Prerequisite(s): MGT 200; graduate standing. Introduces methods for managing the firm's human resources within the context of regulatory and economic conditions and changing workforce demographics. Topics include recruitment and selection, compensation and reward systems, employee development and appraisal, and information systems for meeting HRM objectives.

MGT 211 Financial Accounting 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers financial accounting concepts and the analytical tools needed to understand and interpret financial statements. Examines the uses of financial accounting information.

MGT 212 Application of Behavioral Economics to Management, Decision-Making, and Policy 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers behavioral economics and the applications to management, decision making, and policy. Includes social preferences, heuristics and biases, choice effects, emotions and self-control, psychology of money, behavioral finance, dishonesty and revenge, and group decision making.

MGT 213 Trading Strategies and Financial Models 4 Lecture,3 hours; individual study, 3 hours. Prerequisite(s): ECON 205A, MGT 202, MGT 295F; graduate standing; or consent of instructor. Introduces the most well-known empirical deviations from the capital asset pricing model (CAPM) stock market anomalies. Includes ways to predict market strength, profit, and measure the risk and trading costs of performing such trading strategies.

MGT 214 Corporate Strategy 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MGT 235; graduate standing. For the MGT 214 online section: enrollment in the Executive Masters of Business Administration program; graduate standing. Examines the corporate strategies of multi-business organizations, assesses their effectiveness, and develops more viable alternatives. Explores the main challenges large organizations face and contrasts the challenges of multi-business organizations with single-business firms. Focuses on the analysis of real-world organizations.

MGT 215 International Comparative Management 4 Lecture, 3 hours; outside projects and readings, 3 hours. Prerequisite(s): graduate standing Comparative analysis of significant management practices. The impacts of cultural, political, social, and economic factors on decision making within the international arena are examined.

MGT 216 Managerial Decision Making 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces how individuals make decisions as managers and consumers, as well as improving decision-making skills. Covers intuitive versus analytic processes; prospect theory and loss aversion; heuristic judgments of uncertainty; confirmation bias; overconfidence; mental accounting; intertemporal choices; memory and mindlessness; social heuristics; prediction models; hedonic decision making; and choice architecture.

MGT 218 Ethics in Management 4 Lecture, 3 hours. Prerequisite(s): graduate standing. Examines ethical dilemmas faced by managers and organizations and extends decision analysis to include the ethical dimension present in most policy decisions. Seeks to increase the students' ability to identify and respond to ethical issues in organizations, including such areas as affirmative action, bribery, deception, working conditions, product safety, environmental impact, and international relations.

MGT 219 Spreadsheet Modeling For Decision-Making 4 Lecture, 3 hours; extra reading, 1.5 hours; individual study, 1.5 hours. Prerequisite(s): MGT 207; graduate standing; or consent of instructor. Introduces tools for using data to make informed managerial decisions. Addresses modeling, optimization on a spreadsheet, and analysis of the software outputs. Topics include basic Excel tools, decision analysis via decision trees, and linear and nonlinear optimization using the Excel Solver. Draws applications from operations, finance, marketing, and management fields.

MGT 220 Negotiations For Managers 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Develops understanding of the theory and processes underlying a broad spectrum of negotiation problems. Applies learned analytic and interpersonal skills to attain competence in negotiation exercises and debriefings

MGT 221 Decision Making Under Uncertainty 4 Lecture, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): MGT 207 or consent of instructor. Introduces basic tools for using data to make informed managerial decisions under uncertainty. Addresses modeling, performance evaluation, and optimization of systems with uncertain parameters. Topics include Markov chains, Markov decision processes, and probabilistic linear and dynamic programming. Applications are drawn

from operations, finance, marketing, and other management fields.

MGT 222 Strategic Organization Change 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): MGT 200, MGT 235; graduate standing; or consent of instructor. Provides a managerial perspective on organization change. Discusses the strategic need for change, surveys possible solutions, and analyzes the difficulties of choosing the "right" strategy. Highlights best practices and common pitfalls of implementation change. Uses case analysis, group exercises, and simulation to convey the complexity of organization change.

MGT 223 Diversity and Reducing Bias in Organizations 4 Lecture, 3 hours; activity, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Covers management topics for understanding how to navigate, manage, and lead diverse organizations more effectively. Topics include diversity in organizations, cross-cultural management, research-based strategies for reducing bias in organizations, and workplace inclusion.

MGT 224 Managing For Quality Improvement 4 Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): MGT 201; graduate standing; or consent of instructor. Discusses the operational aspects of quality improvement in manufacturing and service organizations. Focuses on the broader issues of total quality management, statistical process control, and the difficulties in implementing quality efforts in organizations.

MGT 225 Professional Accounting and Auditing Research 4 Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): graduate standing. Provides an in-depth examination of the professional accounting and auditing research process. Includes issue identification; location and evaluation of authority using online and electronic accounting, auditing, and tax research databases; developing conclusions and recommendations; and communication of research results.

MGT 226 Fraud and Forensics Auditing 4 Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): MGT 204 or equivalent; graduate standing. Addresses forensic accounting and fraud examination in how it pertains to both civil and criminal matters. Develops a basic understanding of the characteristics of fraud, fraud prevention and detection, investigative techniques, asset recovery, and use of information technology.

MGT 227 Fixed-Income Securities and Markets 4 Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): MGT 201; graduate standing. Covers analytical techniques related to fixed-income securities. Includes basic analytical tools in fixed-income markets. Topics include relative pricing of fixed-income securities, yield-curve estimation, securities with embedded options, and trading strategies. Utilizes interest rate swaps, mortgage-backed securities, and credit derivatives.

MGT 228 Consumer Behavior 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): MGT 209; graduate standing; or consent of instructor. Studies the processes individuals and groups use to select, secure, use, and dispose of products, services, experiences, or ideas to satisfy needs. Explores the impacts that these processes have on the consumer and society. Addresses external and internal influences on consumer behavior.

MGT 229 Accounting Ethics and Professional Responsibilities 4 Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): MGT 204 or equivalent; graduate standing. Examines the ethical and professional responsibilities of accountants and auditors. Focuses on ethics, the American Institute of Certified Public Accountants (AICPA)'s Code of Professional Conduct, Circular 230, the Sarbanes-Oxley Act (SOX), Securities and Exchange Commission (SEC) laws and regulations, Public Company Accounting Oversight Board (PCAOB) standards, state and federal laws relevant to accountants, auditors, and Certified Public Accountants.

MGT 230 Databases For Management 4 Lecture, 3 hours; outside projects and readings, 3 hours. Prerequisite(s): MGT 205; graduate standing. Examines the features and capabilities of database management systems, including database classification, data structures, file organizations, evaluation, and management of database systems.

MGT 231 Corporate Finance 4 Lecture, 3 hours; extra reading, 1.5 hours; outside problem sets, 1.5 hours. Prerequisite(s): MGT 202; graduate standing. An intensive analysis of the effects of corporate financial policy decisions on firm value. Examines the interrelation of firm value, financing policy, investment decisions, and other considerations. Provides an understanding of the theoretical issues involved in the choice of these policies.

MGT 232 Derivatives and Asset Pricing 4 Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): MGT 202; graduate standing. Explores the pricing of derivatives-based securities. Covers various topics in derivatives markets. Introduces pricing techniques for forwards, futures, options, swaps, and other derivatives. Utilizes empirical data and financial modeling.

MGT 233 Marketing Research 4 Lecture, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): MGT 201, MGT 209; graduate standing; or consent of instructor. Examines how marketing-related data is gathered from individuals and organizations. Explores the importance of integrating problem formulation, research design, questionnaire construction, and sampling so as to yield the most valuable information. Also studies the proper use of statistical methods and the use of computers for data analysis.

MGT 234 Brand Management 4 Lecture, 3 hours; activity 2, hours; term paper, 1 hour. Prerequisite(s): MGT 209; graduate standing; or the consent of instructor. Provides an understanding of the activities and responsibilities of a brand or product manager. Discusses brand equity and how to measure and build brand equity. Analyzes brand manager's activities as creating, building, and growing the brand and managing the marketing mix activities as advertising and promotion to achieve desired results.

MGT 235 Strategic Management 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Studies the formulation, implementation, and evaluation of business unit and corporate strategies and the organizational policies and managerial practices that support them. Applies theory to actual general management problems using cases, group exercises, and other simulations of strategic challenges.

MGT 236 Decision Making Under Certainty 4 Lecture, 3 hours; outside projects and extra reading, 3 hours. Prerequisite(s): MGT 207; graduate standing; or consent of instructor. Introduces basic tools for using data to make informed managerial decisions under certainty. Covers modeling and solution methods in network optimization, integer and nonlinear programming, and multiple criteria decision analysis. Examines applications and case studies in operations, logistics, finance, and marketing.

MGT 237 International Financial Management 4 Lecture, 3 hours; extra reading, 1 hour; outside projects, 2 hours. Prerequisite(s): MGT 202; graduate standing. Focuses on the nature, risks, and management of foreign exchange exposure in a corporate setting. Covers trade and international investment theories. Topics include the international financial systems, balance of payments, foreign exchange markets, measurement of foreign exchange risk, hedging, international asset pricing, and trade financing.

MGT 238 Management Synthesis 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MGT 200; MGT 202; MGT 203; MGT 205; MGT 207; MGT 209; MGT 235; graduate standing. A team-taught, integrative case course that focuses on managing the complex tasks of the total organization. Examines the interdependence of the functional areas of management. Student teams analyze cases involving several functional areas and recommend actions for improvement.

MGT 239 Simulation For Business 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MGT 201; graduate standing; or consent of instructor. Develops ability in business modeling and simulation analysis. Focuses on abstracting and formulating the problems, identifying variables, structuring static dynamic simulation mechanisms, analyzing outputs, conducting sensitivity analysis, and providing recommendations. Includes business models from operations (e.g., supply risk), finance (e.g., asset pricing), and marketing (e.g., sales force management)."

MGT 240A Taxation 4 Lecture, 3 hours; outside projects and extra reading, 3 hours.

Prerequisite(s): MGT 211 or equivalent; graduate standing; or consent of instructor. Covers federal income tax laws as they apply to individuals, partnerships, and corporations. Also discusses tax planning, tax policy, and other special tax issues.

MGT 240B Advanced Taxation 4 Lecture, 3 hours; outside case analysis, 3 hours. Prerequisite(s): MGT 240A or equivalent; graduate standing. Articulates advanced topics in federal taxation and tax planning. Explores many facets of the complex body of tax law including tax research, alternative minimum tax, investment losses, employee compensation, corporate distributions, and federal transfer taxes.

MGT 241 Accounting Systems and Control 4 Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): MGT 204 or equivalent; graduate standing. A study of the design and implementation of internal control systems. Emphasizes auditing, accounting information systems, ethical and trust systems, and related issues.

MGT 242 Global Marketing Management 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): MGT 209; graduate standing; or consent of instructor. Examines the processes and the means by which companies can successfully extend their marketing operations internationally and globally. Provides the frameworks, knowledge, and sensitivities to formulate and effectively implement marketing plans in various countries and regions of the world.

MGT 243 Entrepreneurial Marketing 4 Lecture, 3 hours; activity, 2 hours; individualized study,1 hour. Prerequisite(s): MGT 209; graduate standing; or the consent of instructor. Addresses the marketing challenges in conceptualizing, launching, and growing an entrepreneurial venture. Provides a conceptual framework and market research tools for evaluating and validating entrepreneurial ideas. Discusses alternative business models and promotion strategies for launching entrepreneurial ventures.

MGT 244 Corporate Risk Management 4 Lecture, 3 hours; written case analyses and reports, 3 hours. Prerequisite(s): MGT 202; graduate standing. Provides an overview of derivative financial instruments. Focuses on the use of derivatives to manage risk in a corporate setting. Utilizes the case-method to develop strategies and policies for managing the risk exposure of an enterprise, as well as to assess the relations between risk management and value creation.

MGT 245 Financial Statement Analysis 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): MGT 211; graduate standing; or consent of instructor. Explains the role of financial statement analysis in an efficient capital market. Data from financial statements of major corporations is analyzed to develop skills necessary to interpret financial accounting information. Designed for future professionals who will be intensive users of financial accounting reports (e.g., security analysts, credit analysts).

MGT 246 Entrepreneurial Management 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MGT 202, MGT 209; graduate standing; or consent of instructor. Studies the entrepreneurial process, its challenges, and the driving forces behind it--the managerial skills, mental attitudes, and basic knowledge necessary for creating and growing a new venture. Topics include opportunity assessment, building the management team, marshalling capital and other critical resources, and harvest strategies.

MGT 247 Marketing Communications Management 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MGT 209; graduate standing; or consent of instructor. Focuses on modern marketing communications strategy and considerations for effective integration of multiple different communication tools including advertising, social, and promotions. Discusses how to develop and use marketing communications to influence customers throughout the decision-making process. Includes setting communication objectives; media strategy; ad sales promotion strategy, and evaluating marketing communications.

MGT 248 New Product Development 4 Lecture, 3 hours; term paper, 1 hour; research, 2 hours. Prerequisite(s): MGT 209; graduate standing; or consent of instructor. Covers the management of a new product development process. Includes opportunity identification and idea generation, concept and product testing, pre-launch forecasting, and managing a product launch.

MGT 249 Pricing Strategy 4 Lecture, 3 hours; consultation or discussion, 1 hour. Prerequisite(s): MGT 209; graduate standing; or consent of instructor. The concepts of competitive pricing, price leadership, price discrimination, price warfare, and the strategic implication of skimming versus penetration strategies with respect to the experience curve will be developed.

MGT 250 Marketing Channels and Sales Force 4 Lecture, 3 hours; outside project, 3 hours. Prerequisite(s): MGT 209; graduate standing. .Examines decisions related to distribution channels and sales force. Discusses how to select the most appropriate marketing channel. Channel management topics include distribution intensity, power, control, and channel conflict. Covers issues in sales-force management, compensation, structure, and size.

MGT 251 Marketing Analytics 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MGT 209; graduate standing; or consent of instructor. Examines advanced topics in marketing with emphasis on utilizing quantitative tools to aid marketing decision making. Topics include demand and market-share forecasting; conjoint analysis; market segmentation and cluster analysis; brand positioning and competitive market structures; and assessing market response to price, advertising, promotion, distribution, and sales force.

MGT 252 Investments and Portfolio Management 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): MGT 202. Discusses standard asset pricing models, portfolio theory, and empirical uses of securities data. Addresses pricing in the capital markets and empirical issues in testing asset pricing models. Other topics include risk-adjusted portfolio performance, term structure, bond pricing, and bond portfolio management.

MGT 253 Digital Marketing 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): MGT 209; graduate standing; or consent of instructor. Develops an understanding of digital marketing and how it affects and augments the traditional marketing mix. Topics covered include online retailing and the long tail, online pricing, multi-channel and mobile marketing, search engine optimization, display and sponsored search advertising, and social media marketing.

MGT 254 Internet Retailing Project 4 Lecture, 3 hours; extra reading, 1.5 hours; outside projects, 1.5 hours. Prerequisite(s): MGT 209; graduate standing; consent of instructor. A practical examination of the Internet retailing customer chain from a managerial perspective. Involves special-topic lectures, directed readings, active discussion, and student presentations. Culminates in a class-written book comprised of chapters focusing on team-developed solutions to industry problems.

MGT 255 Procurement and Strategic Sourcing 4 Lecture, 3 hours; term paper, 1 hour; written work, 2 hours. Prerequisite(s): MGT 207; graduate standing; or consent of instructor. Basic concepts and processes in purchasing and sourcing management. Addresses global sourcing techniques and application on various management tools and quality tools in purchasing. Focuses on proactive and planned analysis of supply markets and selection of suppliers with objective of delivering solutions to meet pre-determined and agreed upon organizational needs.

MGT 256 Business Analytics For Management 4 Lecture, 3 hours; written work, 1 hour; extra reading, 1; practicum, 1 hour. Prerequisite(s): MGT 201; graduate standing; or consent of instructor. Provides the fundamental concepts and tools needed to understand the emerging role of business analytics in organizations and apply basic business analytics tools in a spreadsheet environment. Makes extensive use of data, statistical and quantitative analysis, exploratory and predictive models, and fact-based management to drive decisions and actions.

MGT 257 Marketing Strategy 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): MGT 209; graduate standing; or consent of instructor. Presents a framework for an integrated, dynamic analysis of customers and competitors to enable marketing strategy development for long-term success. Uses case studies, lecture-discussions, and a computer-simulated competitive marketing strategy game.

MGT 258 Logistics and Supply Chain Management 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MGT 207; graduate standing; or consent of instructor. Studies the integration of value-creating elements in supply, procurement, manufacturing, distribution, and logistics processes using information technologies as a main enabler. Topics include distribution networks, demand management, sourcing, transportation, pricing, supply chain coordination, information technology, and e-business.

MGT 259 Data Visualization For Business 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MGT 201 or STAT 200; or equivalent; graduate standing; or consent of instructor. Introduces visualization as a tool for analyzing data. Promotes understanding and communication of the underlying story effectively to an audience through static or interactive visual materials including charts and dashboards.

MGT 260 Contemporary Issues in Management 4 Seminar, 30 hours per quarter; individual study, 30 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. Focuses on recent developments and selected topics in contemporary management practices. Discusses innovative practices in areas such as marketing, finance, accounting, information technology, production, and distribution. Includes presentations by students, invited scholars and business professionals. Course is repeatable to a maximum of 8 units.

MGT 261 Contemporary Issues in Entrepreneurship 4 Seminar, 30 hours per quarter; individual study, 30 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. Addresses current issues and innovations in entrepreneurial management to develop a broad understanding of the interrelationship among all functions of management, including marketing, finance, accounting, information technology, production, and distribution. Discusses topics such as family business management, entrepreneurial marketing, managing growth, strategies for innovation, and market entry and exit decision making.

MGT 262 Advanced Topics in Management 4 Seminar, 30 hours per quarter. outside research, 30 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. Intensive study of selected topics in management. Includes readings, discussion, and presentation of research. Requires completion of an analytical research paper based on recent advances in management strategy. Topics include leadership, change, value creation, and innovations in strategies related to the functional areas of management. Course is repeatable to a maximum of 8 units.

MGT 263 Advanced Topics in Entrepreneurship 4 Seminar, 30 hours per quarter. outside research, 30 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. Explores various topics relevant to the development of entrepreneurial skills in a variety of management functions, including marketing, finance, and operations. Includes lectures, case studies, presentations by entrepreneurs, and exercises to provide students with a realistic understanding of entrepreneurial challenges.

MGT 264 Information Systems Resources Management 4 Seminar, 3 hours; outside research, 2 hours; extra reading,1 hour. Prerequisite(s): MGT 205; graduate standing; or consent of instructor. Provides an understanding of the issues, strategies, and tactics involved in managing information systems in large organizations. Topics include cost allocation, capacity planning, congestion problems, and distributed information systems. Relies heavily on case studies.

MGT 265 Web Analytics For Business 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MGT 201 or STAT 200; or equivalent; graduate standing; or consent of instructor. Teaches how to scrape and extract data from the web and to manipulate, visualize, and analyze the web data to derive insights and develop predictive models that support business decisions. Addresses how to comply with legal and ethical aspects of web scraping.

MGT 266 Project Management 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): MGT 207; graduate standing. Addresses issues of project planning and control. Topics include differences between projects and production systems; project selection; project teams; breakdown structures of organization and work; scheduling and budgeting; resources management; project control and evaluation; and current project management software.

MGT 267 Applied Business Forecasting 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): MGT 201; or equivalent; graduate standing.; graduate standing. Provides experience in developing forecasting models and applying them to problems in marketing, production, inventory management, business economics, and other fields. Discusses issues in data acquisition, data analysis, modeling of relations between variables, trend analysis, and seasonal forecasting. Uses case studies and applications from a variety of management areas.

MGT 268 Entrepreneurial Finance and Venture Capital 4 Seminar, 3 hours; extra reading, 1 hour; activity, 2 hours. Prerequisite(s): MGT 202; graduate standing. For the MGT 268 online section; enrollment in the Executive Masters of Business Administration program; graduate standing. Covers financing of nonpublic and early-stage venture. Includes financial modeling, cash needs assessment, valuation, deal structure, financing alternatives, and harvesting.

MGT 269 The New Venture and the Business Plan 4 Seminar, 3 hours; outside research, 2 hours; case study preparation, 1 hour. Prerequisite(s): MGT 246; graduate standing; or consent of instructor. Focuses on the entrepreneurial process from conception to birth of a new venture. Explores the process of developing an opportunity assessment, structuring and rewarding the founding management team, and marshalling necessary critical resources through the development of a full-scale business plan.

MGT 271 Quantitative Decision Making and Analysis 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers many approaches to solving business problems from a managerial point of view. Surveys various optimization techniques with an emphasis on the why and how of these types of models. Utilizes spreadsheet solvers to accomplish the mathematical manipulations. Emphasizes input requirements and interpretation of results.

MGT 272 Global Strategy and Management 4 Seminar, 3 hours; outside projects, 3 hours, Prerequisite(s): MGT 200, MGT 202, MGT 209; graduate standing; or consent of instructor. Provides an overview of the strategic issues that multinational firms and managers encounter in a global marketplace. Topics include the globalization of the world economy, mode of entry into markets, analysis of political risk, global strategic alliances, and competing in emerging economies.

MGT 273 Marketing Experience Projects 4 Consultation, 1 hour; research, 6 hours; term paper, 3 hours. Prerequisite(s): MGT 209; or equivalent; graduate standing; or consent of instructor. Promotes a collaborative environment to acquire experience in analyzing a marketing-related question faced by a client organization. Includes performing the necessary research and analysis to formulate a recommendation for the client and communicating the recommended solution to the client.

MGT 274 Special Topics in Finance 4 Seminar, 3 hours; research 3 hours. Prerequisite(s): MGT 202; graduate standing. Explores the latest developments in theoretical and empirical finance. Topics include asset pricing, performance evaluation, derivative securities, market microstructure, corporate finance, and corporate control and governance.

MGT 275 Transportation and Logistics Management 4 Lecture, 3 hours; term paper, 1 hours; written work, 2 hours. Prerequisite(s): MGT 207; graduate standing; or consent of instructor. Provides insight into the key functional areas related to transportation and logistics management within supply chain operations. Focuses on the role of transportation systems and the managerial and economic aspects of various transportation modes, transport, storage/handling, and facility location decisions. Presents applications to both domestic and international operations.

MGT 276 Financial Strategy and Corporate Control 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): MGT 202; graduate standing. Covers the nexus among finance, strategy, governance, and corporate control. Examines the theory and empirical evidence for models of corporate financial policy and the market for corporate control. Emphasizes

critical evaluation of the evidence for different models of corporate financial policy.

MGT 277 Advanced Financial Accounting 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): BUS 165C or equivalent (may be taken concurrently); graduate standing. Covers advanced financial accounting and reporting practices. Emphasizes topics such as consolidated financial statements, branch accounting, foreign transactions, segment reporting, partnership accounting, and accounting for nonprofit organizations.

MGT 278A Foundations of Auditing and Assurance Services 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): admission to the Master of Professional Accountancy (MPAc) program or graduate standing and consent of instructor. Examines the history, demand, and foundations of audit and assurance. Focuses on judgment and fundamentals of evidential reasoning. Topics include risk assessment, internal control, audit evidence, independence and objectivity, measurement theory, suitable criteria, standards and regulation, framing, heuristics and biases, and the role of technology.

MGT 278B Information Technology Auditing and Assurance 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): MGT 278A; graduate standing; or consent of instructor. Covers basic concepts and techniques used in the provision of information technology audit and assurance services. Topics include information technology security; risk assessment; internal control; nature of audit evidence; independence and objectivity; suitable criteria; the role of standards and technology; and ethical issues.

MGT 278C Internal Auditing 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): MGT 278A; graduate standing; or consent of instructor. Examines the nature and practices of internal (operational) audit and assurance, the management audit process, and the use of internal auditing by top management and governing boards. Develops skills to understand, analyze, and critically evaluate internal audit research.

MGT 279 Tech Product Management 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MGT 209; or equivalent; graduate standing; or consent of instructor. Provides students with an understanding of product management for technology products covering processes, tools and techniques useful to a product manager.

MGT 280 Business Issues in Electronic Commerce 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): MGT 205; graduate standing. Provides an understanding of the various business strategies, management issues, and pertinent technologies related to electronic commerce. Explores several of the problems surrounding electronic commerce including security issues, privacy, encryption, safeguarding of intellectual property rights, acceptable use policies, and legal issues.

MGT 281 Systems Analysis and Design 4 Seminar, 3 hours; outside project, 3 hours. Prerequisite(s): MGT 205, MGT 230; graduate standing; or consent of instructor. Provides an understanding of the systems development life cycle with emphasis on the analysis and design phases. Familiarizes students with the tools and processes used by system developers to analyze, design, and construct computer-based systems. Provides experience in analyzing and designing a computer-based system.

MGT 282 Business Data Communications 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): MGT 205; graduate standing. Provides insight into the role of telecommunications in business, with an emphasis on information management. Specific topics include data communications (hardware components, interfaces, and link protocols); architecture and technology (protocols, local area networks, and emerging digital services); and network management (control and security).

MGT 283 Data Mining and Machine Learning For Marketing 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MGT 209; or equivalent; graduate standing; or consent of instructor. Develops insights from the large amount of customer transaction, clickstream, and social media engagement data available to firms. Utilizes data mining and machine learning tools.

MGT 285 Field Colloquium 1 Colloquium 1, Prerequisite(s): graduate standing or consent of instructor. Includes oral reports by visiting scholars, faculty, and students on current research topics in management. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

MGT 286A Capstone in Business Analytics 4 Seminar, 3 hours; research, 1 hour; written work, 2 hours. Prerequisite(s): STAT 209, MGT 256; graduate standing; graduate standing; or consent of instructor. Uses the skills and knowledge developed in the study of business analytics to undertake an individual empirical study. Proposes a topic of inquire and uses quantitative skills to begin analyzing an issue in business. Topics covered include data sources, statistical techniques, business operations, and profitability.

MGT 286B Capstone in Business Analytics 2 4 Seminar, 3 hours; research, 1 hour; written work, 3 hours. Prerequisite(s): STAT 209, MGT 256, MGT 286A; graduate standing; graduate standing; or consent of instructor. Uses the skills and knowledge developed in business analytics courses to complete an individual empirical study. Focuses on finishing work initiated in MGT 286A involving a project that uses quantitative skills to analyze an issue in business. Topics include data sources, statistical techniques, business operations, and profitability.

MGT 288A Behavioral Research in Marketing 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. Examination of the development of consumer behavior research and evaluation from theoretical as well as practical perspectives. Provides insight into the integrative framework for organizing knowledge of consumer behavior and conducting research.

MGT 288B Quantitative Research in Marketing 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. Introduces the fundamentals of modeling in marketing. Studies research issues associated with marketing management decisions. Emphasizes empirical research. Examines of strategic marketing, marketing segmentation, new product development and introduction, pricing strategies, channel policy, promotion decisions, and sales force management.

MGT 288C Special Topics in Marketing-Behavioral 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. An in-depth examination selected topics in consumer behavior. Utilizes journal articles to facilitate exploration of these topics.

MGT 288D Special Topics in Marketing - Quantitative 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. A study of the modeling of consumers and markets. Topics include conjoint analysis, logit choices models, market structure analysis, consideration sets, variety seeking, and models of purchase timing and purchase quantity. Utilizes journal articles to facilitate exploration of these topics.

MGT 289A Micro Organizational Theory 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. A study of the intersection of individual and group behavior within organizations. Introduces the behavioral science literature relevant to the study of behavior in organizational. Topics include emotions in organizations, motivation, leadership, decision making, interpersonal relations, diversity and identity, culture, and organizational learning and routines.

MGT 289B Macro Organizational Theory 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. A study of theories related to structure of organizations and control systems both within and external to the organization. Emphasizes the interaction of organizations with their environments. Incorporates theoretical and empirical contributions from institutional analysis, resource dependence, population ecology, and transaction costs.

MGT 289C Strategic Management 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. Focuses on the conduct and performance of organizations. Topics in strategy research explain differences in organizations' profitability and survival by relating variance in these performance outcomes to factors at multiple levels. Provides theoretical perspectives from economics, sociology, and psychology to supplement approaches to understanding firm performance and related issues.

MGT 289D Designing Organizational Research 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): doctoral standing or consent of instructor. Provides a survey of the design approaches for non-laboratory study within and across organizations. Covers research strategies appropriate to the study of different organizational questions. Topics include issues of measurement, types of data, and data collection methods (including archival, surveys, interviews, and social network data).

MGT 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; and consent of instructor. Directed studies and research in selected problems or theories of management for advanced graduate students to pursue special areas of interest. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MGT 292 Concurrent Studies in Management 1 to 4 Research, 3 to 12 hours. Prerequisite(s): graduate standing; consent of instructor. Explores one or more graduate projects based on content related to an appropriate undergraduate course. Includes faculty guidance and evaluation. Taken concurrently with the undergraduate course.

MGT 293 (E-Z) Seminars in Accounting 4 Seminar, 3 hours; individual study, 1 hour; extra reading, 2 hours. Prerequisite(s): restricted to major(s) Accnting, Auditing & Assuranc, Finance, Management, Management; graduate standing. Topics include financial accounting; accounting standards; earning quality and management; earning forecasts and financial analyst; valuation; performance evaluations; strategic management accounting; auditor behavior and decision making; tax policy planning; managerial accounting decision-making; accounting information systems, accounting and capital markets, research design methodologies in accounting, accounting information, disclosure game theory.

MGT 293F Capital Markets Research in Accounting 4 Seminar, 3 hours; extra reading, 2 hours; individual study, 1 hour. Prerequisite(s): graduate standing in Management, or consent of the instructor. Includes issues in financial accounting related to the interaction of accounting and capital markets. Focuses on selected classic and current empirical and theoretical research in financial accounting. Provides advanced training in empirical accounting research with an emphasis on securities market effects of accounting policies and practices.

MGT 295 (E-Z) Seminars in Finance 4 Seminar, 3 hours. Prerequisite(s): restricted to major(s) Accnting, Auditing & Assuranc, Finance, Management, Management; graduate standing. Topics include discrete and continuous time asset pricing theory and portfolio choice; empirical research in finance (including recent developments in empirical asset pricing); and advanced topics in corporate finance theory and related empirical research.

MGT 295E Theory of Exchanges Under Uncertainty 4 Seminar, 3 hours; written work, 15 hours per quarter, extra reading, 2 hours. Prerequisite(s): graduate standing in Management; or consent of instructor. An introduction to the theory of financial economics. Covers the implications of no arbitrage, decisions under uncertainty, and various equilibrium models in a world with only one decision period. Extends these concepts to multiple periods in discrete time and continuous time.

MGT 295F Empirical Methods in Finance 4 Seminar, 3 hours; term paper, 10 to 15.5 hours per quarter, problem sets involving statistical analysis of stock returns. Students should spend at least 2 hours a week. Prerequisite(s): MGT 201, MGT 202, graduate standing in Management, or consent of instructor. Covers econometric approaches to analyzing common problems encountered when conducting empirical research. Focuses on hypothesis testing, specification tests, general methods of moments estimation, the capital asset pricing model, multifactor asset pricing models, event studies, operating performance studies, simultaneous equations models, and endogeneity issues. Demonstrates programming in SAS and/or Gauss.

MGT 295G Corporate Finance 4 Seminar, 3 hours; extra reading 2 hours; written work, 2 hours. Prerequisite(s): graduate standing in Management or consent of instructor. Deals with the contemporary issues in corporate finance. Focuses on selected classic and current empirical and theoretical research in corporate finance. Seeks to provide an advanced and rigorous background in the mainstream issues of modern corporate finance with an emphasis on empirical methodology.

MGT 295I Asset Pricing Theory 4 Seminar, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): MGT 295F, ECON 205A, graduate standing in Management; or consent of the instructor. Covers equilibrium models of stock returns and their relation to utility theory, arbitrage-based pricing models, options, term structure models and limits to arbitrage

MGT 295J Empirical Methods in Finance 4 Seminar, 3 hours, practicum, 1 hour; extra reading, 2 hours. Prerequisite(s): MGT 295I, graduate standing in Management; or consent of instructor. Covers empirical methods in finance research with an emphasis on empirical asset pricing studies. Topics include methods of testing models related to the theory of asset prices, stock market volatility, and stock returns

MGT 295K Corporate Finance Research 4 Seminar, 3 hours; extra reading, 2 hours; written work, 1 hour; individual study, 3 hours. Prerequisite(s): MGT 295G, graduate standing in Management; or consent of instructor. Covers fundamental articles incorporate finance and more recent empirical papers. Topics include agency problems, asymmetric information, governance, capital structure and merges

MGT 295M Research Seminar in Finance 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing in Management; or consent of instructor. Designed for finance Ph.D. students in their second through fifth year. Study finance economics articles and present research papers. Course is repeatable to a maximum of 20 units.

MGT 296 (E-Z) Seminar in Operations 4 Seminar, 3 hours; individual study, 1 hour; extra reading, 2 hours. Prerequisite(s): STAT 215 or MATH 209A, MATH 209B; graduate standing. Topics include revenue optimization; stochastic and deterministic dynamic programming applications in operations; inventory management; supply chain systems; dynamic optimization applications of management, economics and engineering; agency theory; signaling games; actions; behavioral economics pricing management; price discriminations; supply risk; sales force management; operations-marketing interface

MGT 296E Dynamic Optimization 4 Seminar, 3 hours; extra reading, 2 hours; individual study, 1 hour. Prerequisite(s): STAT 215 or MATH 209A, MATH 209B, graduate standing; or consent of instructor. Focuses on basic models and solution techniques for problems of sequential decision making under uncertainty (stochastic control). Considers optimal control of a dynamical system over both a finite and an infinite number of stages. Includes application domains, revenue management and pricing, manufacturing, supply chains, service systems and economics.

MGT 296F Game Theory Models in Operations 4 Seminar, 3 hours; extra reading, 2 hours; individual study, 1 hour. Prerequisite(s): ECON 201A, ECON 201B, graduate standing in Management; or consent of instructor. Focuses on game theory and industrial organization ideas applied to operations management. Topics include strategic form games, dynamic games, signaling games, agency theory, mechanism design, market design, and their applications in operations management

MGT 296G Pricing and Revenue Management 4 Seminar, 3 hours; extra reading, 2 hours; individual study, 1 hour. Prerequisite(s): MGT 296E, MGT 296F, graduate standing; or consent of instructor. Focuses on pricing and revenue management ideas applied to operations management. Topics include price discrimination, contract theory, auctions, advertisement, and industry applications.

MGT 296H Inventory and Supply Chain Management 4 Seminar, 3 hours; extra reading, 2 hours; individual study, 1 hour. Prerequisite(s): MGT 296E, MGT 296F, graduate standing; or consent of instructor. Focuses on inventory theory and supply chain contracting. Topics include inventory policies, strategic competition, coordination, contracts in supply chain.

MGT 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; and consent of instructor. Directed research in selected problems of management for graduate students with special research interests. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MGT 298I Fieldwork in Management 1 to 4 Consultation, 1 hour; field, 3 to 12 hours. Prerequisite(s): graduate standing; and consent of instructor. Supervised field experience culminating in a final report or other academic component. May be repeated for up to 8 units of credit toward the degree.

MGT 299 Research For Thesis Or Dissertation 1 to 12 Tutorial, 3 to 36 hours Prerequisite(s): graduate standing; and consent of instructor. Research for Thesis and Dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

MGT 302 Apprentice Teaching 1 to 4 Seminar, 1 to 4 hours. Prerequisite(s): limited to departmental teaching assistants; graduate standing. Supervised individual instruction in teaching including monitoring of teaching assistant's activities and regular consultation with assistant concerning teaching responsibilities. Graded Satisfactory (S) or No Credit (NC). May be repeated; not for degree credit.

MGT 400A Financial Accounting Principles and Practices 1 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to the Master of Professional Accountancy (M.P.Ac.) program; graduate standing; and consent of instructor. Covers technical accounting theory and principles necessary for graduate work. Credit toward degree limited to M.P.Ac. students.

MGT 400B Financial Accounting Principles and Practices 2 4 Lecture, 20 hours per quarter; discussion, 20 hours per quarter. Prerequisite(s): MGT 400A; graduate standing; or consent of instructor. A continuation of technical accounting theory and principles necessary for graduate work. Credit toward degree limited to M.P.Ac. students.

MGT 400C Managerial Accounting/ Accounting Information Systems 4 Lecture, 20 hours per quarter; discussion, 20 hours per quarter. Prerequisite(s): graduate standing and consent of instructor or admission to the Master of Professional Accountancy (M.P.Ac.) program. Managerial accounting and accounting information systems concepts necessary for graduate work.

MGT 400D Taxation of Individuals and Business Entities 4 Lecture, 20 hours per quarter; discussion, 20 hours per quarter. Prerequisite(s): graduate standing and consent of instructor or admission to the Master of Professional Accountancy (M.P.Ac.) program. Taxation rules and regulations for individuals and business entities necessary for graduate work.

MGT 400E Auditing and Assurance 4 Lecture, 20 hours per quarter; discussion, 20 hours per quarter. Prerequisite(s): graduate standing and consent of instructor or admission to the Master of Professional Accountancy (M.P.Ac.) program. Audit and assurance concepts necessary for graduate work.

MGT 402 Business Career Professional Development Workshop 2 Seminar, 1 hour; consultation, 1 hour; individual study,4 hours. Prerequisite(s): graduate standing in a program in the Anderson Graduate School of Management. Provides skill development and experience to network in person and via social media outlets. Offers a platform for practical implementation of effective job search strategies in various industries. Sets stage for development and presentation of student's ideas clearly at internship and job interviews. Graded Satisfactory (S) or No Credit (NC).

MGT 403 Review of Quantitative Methods For Management 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Reviews quantitative concepts and techniques related to the various functional areas of management. Topics include properties of functions, systems of equations and matrices (linear algebra), differentiation and integration (calculus), and basic probability concepts. Graded Satisfactory (S) or No Credit (NC).

MGT 404 Communications, Leadership, Teams, and Ethics 2 Lecture, 7 hours per quarter; workshop, 28 hours per quarter. Prerequisite(s): graduate standing. Uses case discussions, presentations, and theoretically informed readings to develop communication, presentation, and leadership skills; examine the principles of effective teamwork; and introduce representative ethical issues confronting managers. Not for degree credit. Graded Satisfactory (S) or No Credit (NC).

Marxist Studies Minor

College of Humanities, Arts, and Social Sciences

Bronwyn Leebaw, Chair
Sproul 4124
(951) 827-1473; marxiststudies.ucr.edu

Committee in Charge

Bronwyn Leebaw, Chair (Political Science)
Jennifer Doyle (English)
Alfonso Gonzalez, (Ethnic Studies)
Daryle Williams, Dean, *ex officio*

The Marxist Studies minor integrates courses from various disciplines in order to examine the theory and main applications of Marxism in the social sciences and humanities disciplines.

Requirements for the minor (24 units)

1. Theory, method, and history of thought requirement
   a) PHIL 153
2. Four courses from the following dealing with applications of Marxist studies in various fields:
   a) ANTH 131
   b) CPLT 180X
   c) ECON 175
   d) POSC 160
   e) WRLT 170/ETST 170

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Materials Science and Engineering

Subject abbreviation: MSE
The Marlan and Rosemary Bourns College of Engineering

Juchen Guo, Ph.D., Chair
Materials Science and Engineering Program
313 Materials Science and Engineering Building;
(951) 827-4414
https://www.mse.ucr.edu/

Program Faculty
Distinguished Professors

Reza Abbaschian, Ph.D. (Mechanical Engineering)
Pingyun Feng (Chemistry)
Umar Mohideen, Ph.D. (Physics and Astronomy)
Ashok Mulchandani, Ph.D. (Chemical and Environmental Engineering)
Jing Shi (Physics)
Kambiz Vafai, Ph.D. (Mechanical Engineering)
Michael R. Zachariah, Ph.D. (Chemical and Environmental Engineering)
Francisco Zaera, Ph.D. (Chemistry)

Professors

Christopher Bardeen, Ph.D. (Chemistry)
Ludwig Bartels, Ph.D. (Chemistry)
Boniface Fokwa Ph.D. (Chemistry)
Nathaniel Gabor Ph.D. (Physics and Astronomy)
Juchen Guo Ph.D. (Chemical and Environmental Engineering)
Roger Lake, Ph.D. (Electrical and Computer Engineering)
Huinan Liu Ph.D. (Bioengineering)
Jianlin Liu, Ph.D. (Electrical and Computer Engineering)
Christopher Lynch, Ph.D. (Dean, BCOE)
Lorenzo Mangolini Ph.D. (Mechanical Engineering)
Allen Mills, Ph.D. (Physics and Astronomy)
Leonard Mueller, Ph.D. (Chemistry)
Cengiz Ozkan, Ph.D. (Mechanical Engineering)
Mihri Ozkan, Ph.D. (Electrical and Computer Engineering)
Victor Rodgers, Ph.D. (Bioengineering)
Harry W.K. Tom, Ph.D. (Physics and Astronomy)
Kathryn Uhrich, Ph.D. (Dean, College of Natural & Agricultural Sciences)
Valentine Vullev, Ph.D. (Bioengineering)
Bryan Wong Ph.D. (Chemical and Environmental Engineering)
Jianzhong Wu, Ph.D. (Chemical Engineering)
Yadong Yin, Ph.D. (Chemistry)

Associate Professors

Sinisa Coh Ph.D. (Mechanical Engineering)
Shane Cybart, Ph.D. (Mechanical Engineering)

Juan Pablo Giraldo, Ph.D. (Botany and Plant Sciences, CNAS)
Alexander Greaney Ph.D. (Mechanical Engineering)
Elaine Haberer, Ph.D. (Electrical and Computer Engineering)
Chen Li Ph.D. (Mechanical Engineering)
Fudong Liu, Ph.D. (Chemical and Environmental Engineering)
Ming Liu, Ph.D. (Electrical and Computer Engineering)
Younjin Min, PhD. (Chemical and Environmental Engineering)
Jin Nam, Ph.D. (Bioengineering)
Masaru Rao, Ph.D. (Mechanical Engineering)
Peng Wei Ph.D. (Physics and Astronomy)
Richard Wilson Ph.D. (Mechanical Engineering)
Ruoxue Yan, Ph.D. (Chemical and Environmental Engineering)

Assistant Professors

Igor Barsukov, Ph.D. (Physics and Astronomy)
Xi Chen, Ph.D. (Electrical and Computer Engineering)
Ran Cheng, Ph.D. (Electrical and Computer Engineering)
Matthew Conley, Ph.D. (Chemistry)
Yongtao Cui, Ph.D. (Physics and Astronomy)
Ke Du, Ph.D. (Chemical and Environmental Engineering)
Ahmed El-Moghazy, Ph.D. (Microbiology and Plant Pathology)
Boerge Hemmerling (Physics)
Ruoqian Lin, Ph.D. (Mechanical Engineering)
Tamar Mentzel (Mechanical Engineering)
Timothy Su (Chemistry)
Luat Thanh Vuong, Ph.D. (Mechanical Engineering)
Dmytro Zagrebelnyy (Mechanical Engineering)

**

Adjunct Professor

Matthew Gilbert, Ph.D.

Major

The B.S. degree in Materials Science and Engineering is offered jointly by the five participating departments of The Marlan and Rosemary Bourns College of Engineering. The program aims to produce students who are effective team players in materials engineering or related engineering, science or managerial positions, who use and improve on their skills in the job; who can enter into graduate or professional degree programs; and who are responsible engineers, professionals or scientists demonstrating ethical and professional responsibility and continuing to learn through a variety of educational experiences.

The Materials Science and Engineering Program Educational Objectives are to prepare our graduates to impact an evolving society by producing materials science and engineering constituents who:

- are successful in both education and industry
- can demonstrate professionalism and leadership in cutting edge interdisciplinary materials science and engineering practices
- can utilize an understanding of the principles of materials science and engineering to improve existing systems and innovate and design next generation technologies
- will contribute effectively as individuals, team members, and/or leaders to achieve personal, group and institutional goals.

The Bachelor of Science in Materials Science and Engineering (MSE) Program is accredited by the Engineering Accreditation Commission (EAC) of ABET, abet.org, under the commission's General Criteria and Program Criteria for Materials (1), Metallurgical (2), Ceramics (3) and Similarly Named Engineering Programs. For additional details, visit https://www.mse.ucr.edu/accreditation/.

Change of Major Criteria

All students who request a change of major to Materials Science and Engineering must meet the following requirements:

- Be in good academic standing
- Have no less than a C- in any Math, Science and Engineering coursework
- Have a minimum 2.0 GPA in all Math, Science and Engineering required coursework
- Be able to complete major within maximum allowable units
- Complete all the courses listed below, based on the total number of units earned, prior to submitting the major change request
- UCR transfer students interested in changing to a BCOE major must have been admissible to the major at point of entry, or must satisfy transfer admission and change of major requirements before earning 120 units
- If changing in the 90-119 units category student must have the ability to complete major within 5 years of entry as a Freshmen or 3 years after entry as a Transfer student
- Students who have earned 120 or more units are not eligible for a change of major in BCOE. NOTE: AP/IB units are excluded from maximum unit calculation

Completed 0 to less than 45 units Completion of ENGL 001A with C or better and completion of the following with at least 2.500 GPA:

- CHEM 001A or CHEM 01HA
- CHEM 01LA or CHEM 01HLA
- CHEM 001B or CHEM 01HB
- CHEM 01LB or CHEM 01HLB
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- PHYS 040A or PHYS 040HA

Completed 45 to less than 90 units
Completion of ENGL 001A with C or better and completion of the following with at least 2.500 GPA:

- BIOL 005A or BIOL 05HA
- BIOL 05LA or BIOL 05HLA
- CHEM 001A or CHEM 01HA
- CHEM 01LA or CHEM 01HLA
- CHEM 001B or CHEM 01HB
- CHEM 01LB or CHEM/01HLB
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A or PHYS 040HA

Completed 90 to less than 120 units
Completion of ENGL 001A and ENGL 001B with C or better and completion of the following with at least 2.500:

- BIOL 005A or BIOL 05HA
- BIOL 05LA or BIOL 05HLA
- CHEM 001A or CHEM 01HA
- CHEM 01LA or CHEM 01HLA
- CHEM 001B or CHEM 01HB
- CHEM 01LB or CHEM 01HLB
- CHEM 001C or CHEM 01HC
- CHEM 01LC or CHEM 01HLC
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A or PHYS 040HA

University Requirements

See Undergraduate Studies section.

College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Materials Science and Engineering major uses the following major requirements to satisfy the college's Natural Sciences and Mathematics breadth requirement.

1. One course in the biological sciences chosen from an approved list
2. CHEM 001A, CHEM 001LA
3. MATH 009A
4. PHYS 040A, PHYS 040B

Major Requirements

1. Lower-division requirements (84 units)
   a) CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, CHEM 01LC
   b) CS 009A or CS 010A
   c) EE 005
   d) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
   e) ME 009
   f) MSE 001, MSE 002A, MSE 002B, MSE 002C
   g) PHYS 040A, PHYS 040B, PHYS 040C
   h) CHEM 008A, CHEM 08LA
   i) STAT 010
2. Upper-division requirements (64 units)
   a) EE 138
   b) MSE 100, MSE 110, MSE 120, MSE 134, MSE 135, MSE 143, MSE 146, MSE 160, MSE 161, MSE 175A, MSE 175B
   c) Technical Electives (16 units): Chosen from BIEN/MSE 136, BIEN 140A/CEE 140A, BIEN 140B/CEE 140B, CHE 105, CHE 161, EE 133, EE 136, EE 137, EE 139, EE 162, ME 153, MSE 141, MSE 142, MSE 148, MSE 155, MSE 156, MSE 197

Visit the Student Affairs Office in the College of Engineering or student.engr.ucr.edu for a sample program.

Graduate Program

The Department of Materials Science and Engineering offers programs leading to M.S. and Ph.D. degrees. Research focus areas currently include Materials Processing, Semiconductor Materials, Materials Analysis, Nanoscale Materials, Bioinspired Materials, Ceramic Materials, Magnetic Materials and Materials for Spintronics.

Admission

Applicants should have completed a program equivalent to UCR's B.S. in Materials Science and Engineering, obtained a B.S. in a related discipline and demonstrated particular interest/aptitude for Materials Science and Engineering, or demonstrate the required knowledge and proficiency in the following subjects

1. Fundamentals of Materials Science and Engineering (equivalent to MSE 001)
2. Fundamentals of Chemistry (equivalent to Chem 001A & Chem 001B & Chem 001C)
3. Fundamentals of Physics (equivalent to Phys 040A & Phys 040B and Phys 040C)
4. Fundamentals of Materials Synthesis or Processing (for instance, equivalent to Chem 112A)
5. Nanostructure Characterization or Materials Characterization (equivalent to MSE 160 or MSE 161).

Under special circumstances, students who have not completed all preparation course requirements may be admitted provided that the deficiencies are corrected within the first year of graduate study. Deficiencies limited to 12 units maximum. Courses taken for this purpose do not count towards an advanced degree.

All applicants must submit official scores.
All applicants whose native language is not English and who do not have a degree from an institution where English is the exclusive language of instruction must complete the Test of English as a Foreign Language (TOEFL) with a minimum score of 550 (paper-based), 213 (computer-based), or 80 (Internet-based). UCR will accept scores from the Academic Modules of the International English Language Testing System IELTS, which is jointly managed by the British Council, | 447 IDP:IELTS Australia and the University of Cambridge ESOL Examinations. The exam must be taken within two years of the time prior to enrollment at UCR. The minimum acceptable scores are: overall band score of 7 with no individual section score less than 6. Please request an official Test Report Form (TRF) of your IELTS. Remember to order the TRF from the test center where you took the test and ask the administrator to send the official TRF to:

Graduate Admissions Office
Graduate Division
University Office Building
University of California, Riverside
Riverside, CA 92521 USA

For more information about registering for this exam or to locate the office of any test center, consult the IELTS website.

Applicants must meet the general admission requirements of the Riverside Division of the Academic Senate and the UCR Graduate Council as set forth in the UC Riverside Graduate Student Application.

Master of Science

The Program of Materials Science and Engineering offers the M.S. degree in Materials Science and Engineering. Students may obtain an M.S. degree in Materials Science and Engineering through one of two plans: 1) Thesis or 2) Comprehensive Examination.

Plan I (Thesis)

Students must complete 36 units of graduate or upper-division undergraduate course work, of which 24 must be graduate level units. Student must complete at least one course from 3 of the 5 areas of Materials Science and Engineering (MSE 201-209, 210-219, 220-229, 230-239, 240-249) as well as at least one unit of MSE 200 and at least five units of MSE 250. Students must enroll in MSE 200 the first time it is offered during their residency. At least two units of MSE 250-259 must be taken for a letter grade. Students can take a maximum of 12 units in Graduate Research and a maximum 6 units in Directed Studies. The course of study needs to be approved each quarter by the research advisor (when determined) and the MSE graduate advisor. The degree will be awarded when all these requirements are met and the thesis has been submitted successfully.

Plan II (Comprehensive Exam)

All students must complete 36 units of graduate or upper division undergraduate courses, of which 18 units must be graduate level. Student must complete at least one course from each of the 5 areas of Materials Science and Engineering (MSE 201-209, 210-219, 220-229, 230-39, 240-249) as well as at least one unit of MSE 200 and at least four units of MSE 250. At least one unit of MSE 250-259 must be taken for a letter grade. None may be in graduate research (MSE 297 or MSE 299). A maximum of 6 units may be in Directed Studies. Students must enroll in MSE 200 the first time it is offered during their residency. The course of study needs to be approved each quarter by the MSE graduate advisor.

Students will take a written comprehensive examination conducted jointly with the Ph.D. preliminary examination. The examination emphasizes the fundamental knowledge of the study area rather than the specifics covered in individual courses.

Students concurrently enrolled in a Ph.D. program in another department must have their course of study approved by the Graduate Advisor. Coursework used to complete requirements in a non-MSE Ph.D. program cannot be used towards the Master's degree in MSE. An Oral Comprehensive Examination that measures the student's breadth of knowledge in Materials Science and Engineering will be given after the appropriate course of study has been completed.

Normative Time to Degree

Six quarters (two years)

Doctoral Degree

The Program of Materials Science and Engineering offers the Ph.D. degree in Materials Science and Engineering.

Admission

In addition to the requirements set forth for a M.S. degree, applicants should demonstrate exceptional achievement that clearly indicates their ability to conduct Ph.D. level studies.

Course Work

There is no comprehensive course requirement for the Ph.D. degree; only a few courses are mandatory. The faculty recommends that the student take a minimum of 36 units of graduate or upper-division undergraduate course work covering all five areas of study in Materials Science and Engineering: Thermodynamic Foundation of Materials, Crystal Structure and Bonding, Materials Characterization Techniques, Functional Materials, and Materials Synthesis and Processing (MSE 201-MSE 209, MSE 210-MSE 219, MSE 220-MSE 229, MSE 230-MSE 239, MSE 240-MSE 249). Students must enroll in MSE 200 the first time it is offered during their residency. Students must enroll in MSE 250 during all quarters of residency and must obtain a letter grade in an MSE 250-MSE 259 course once during each academic year of residency except for the first one.

The courses may include graduate course work used for the M.S. degree. The course of study needs to be approved each quarter by the research advisor (when determined) and the MSE graduate advisor. Students may need to take considerably more than the courses indicated above to prepare for and conduct their Ph.D. research.

Preliminary Examination

The purpose of the preliminary examination is to screen candidates for continuation in the doctoral program. The examination is administered by the graduate program committee jointly with the M.S. comprehensive examination. Candidates must solve at least one problem in each of the five areas of study in Material Science and Engineering. Plan II M.S. candidates who took the combined M.S. comprehensive and Ph.D. preliminary examination and successfully passed at the Ph.D. level are given credit for having passed the Ph.D. preliminary examination.

Dissertation Proposal and Oral Qualifying Examination

After passing the preliminary examination at the Ph.D. level, doctoral candidates must prepare and submit a dissertation proposal to their qualifying examination committee at least one month before the qualifying examination. The format of the proposal is flexible, but the proposal should clearly indicate the proposed problem under study, demonstrate substantial knowledge of the topic and related issues, state the progress made towards a solution, and indicate the work remaining to be done. The new approaches and methods to be used in the research should also be discussed. An extensive bibliography for the problem under study should be attached to the proposal. Within one week after submission, the student is informed whether the proposal meets these standards and the student is permitted to proceed to the oral exam.

The oral qualifying examination focuses on the dissertation problem. It includes considerable depth in the student's area of specialization, as required for a successful completion of

the dissertation. The examination is a three-hour session, which begins with the student's presentation of the dissertation topic and is followed with questions and suggestions by the doctoral committee.

Dissertation Examination and Defense
A doctoral dissertation should be an original and substantial contribution to knowledge in the student's major field. The dissertation must demonstrate the student's ability to carry out a program of independent advanced research and to report the results in accordance with standards observed in recognized scientific journals. When the doctoral committee determines that a suitable draft of the dissertation has been presented, a dissertation examination and defense for the student is scheduled. The defense consists of a public seminar followed by questions from the committee members and the audience.

Normative Time to Degree
12 quarters (15 quarters for students without an M.S. in Materials Science and Engineering)

Preparation for Careers in Teaching
All doctoral students are encouraged to serve as teaching assistants for at least three quarters during their graduate career. The program offers a Teaching Practicum in Materials Science and Engineering (MSE 302).

Dissertation Examination and Defense
Contact the Graduate Student Affairs Assistant at the Department of Materials Science and Engineering, (951) 827-3383, or visit mse.ucr.edu for information on graduate courses.

Lower-Division Courses

MSE 001 Introduction to Materials Science and Engineering 1 Lecture, 1 hour. Prerequisite(s): none. Covers the historic origins of Materials Science and Engineering (MSE) as well as its role in the modern society and among modern subjects. Provides general overview for typical career paths as well as roles and responsibilities of MSE graduates in various positions with cross references to the current MSE curriculum. Graded Satisfactory (S) or No Credit (NC).

MSE 002A Fundamentals of Materials Science and Engineering 3 Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): MSE 001. Covers fundamental topics in materials science and engineering, such as materials classification, atomic structure, and interatomic bonding, crystal structures and elements of crystallography, diffusion and mechanical behavior. The laboratory hands on experience complements topics covered during the lectures. Credit is awarded for one of the following MSE 002A or MSE 002L.

MSE 002B Foundamentals of Materials Science and Engineering 3 Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): MSE 001. Covers fundamental topics in materials science and engineering such as phase binary and ternary phase diagrams; phase transformations; applications and processing of metal alloys, structures, properties; and processing of ceramic materials, polymers, and characterization techniques. The laboratory hands on experience complements topics covered during the lectures. Credit is awarded for one of the following MSE 002B or MSE 003L.

MSE 002C Fundamentals of Materials Science and Engineering 3 Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): MSE 001. Covers fundamental topics in materials science and engineering, such as composite materials, corrosion and degradation, electrical, thermal, magnetic and optical properties of materials as well as environmental, economic and ethical aspects. The laboratory hands on experience complements topics covered during the lectures. Credit is awarded for one of the following MSE 002C or MSE 004L.

MSE 002L General Materials Laboratory Spring 1 Laboratory, 3 hours. Prerequisite(s): MSE 001 with a grade of C- or better; restricted to major(s) Materials Science and Engineer; or consent of instructor. Provides hands-on laboratory experience in topics related to the Structure-Composition-Processing-Performance relationship of ceramics, electronic materials, metals, and polymers. Experiments cover mechanical testing and properties of different materials classes and introduce students to microscopic characterization techniques. Satisfactory(S) or No Credit(N/C) is not available.

MSE 003L General Materials Laboratory Fall 1 Laboratory, 3 hours. Prerequisite(s): MSE 001 with a grade of C- or better; restricted to major(s) Materials Science and Engineer; or consent of instructor. Provides hands-on laboratory experience in topics related to the Structure-Composition-Processing-Performance relationship of ceramics, electronic materials, metals, and polymers. Experiments cover materials processing and failure modes of different materials classes. Satisfactory(S) or No Credit(N/C) is not available.

MSE 004L General Materials Laboratory Winter 1 Laboratory, 3 hours. Prerequisite(s): MSE 001 with a grade of C- or better; restricted to major(s) Materials Science and Engineer; or consent of instructor. Provides hands-on laboratory experience in topics related to the Structure-Composition-Processing-Performance relationship of ceramics, electronic materials, metals, and polymers. Experiments cover electrical, thermal, optical, and magnetic properties. Introduces composites and the factors that affect its properties and mechanical performance. Satisfactory(S) or No Credit(N/C) is not available.

MSE 100 Materials Thermodynamics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A, PHYS 040B or PHYS 040HB; restricted to class level standing of junior, senior, or masters; or consent of instructor. An introduction to classical and statistical thermodynamics principles of interest to materials scientists and engineering. Explore criteria for equilibrium, reaction and phase equilibria, equations of state, and phase diagrams. Includes applications of thermodynamics in materials processing and phase stability.

MSE 110 Statics & Mechanics of Materials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C, PHYS 040A or PHYS 040HA. Covers basic principles of statics including equilibrium equations and free body diagrams, axial loading, torsion and shear forces, and stresses analysis and principal stresses. Also addresses column stability analysis and buckling as well as practical implications to materials science and engineering problems.

MSE 120 Transport Phenomena in Materials Science and Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MSE 100. Covers fundamental aspects of heat transfer by conduction, convection, and radiation as well as mass transfer by diffusion. Provides introduction to internal and external flows including laminar and turbulent conditions and boundary layer problems as well as coverage for boiling and condensation.

MSE 134 Microstructural Transformations in Materials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 114 or consent of instructor. An introductory study of the fundamentals (thermodynamics and kinetics) controlling microstructural transformations in materials and their application to both liquid-solid and solid-solid transformations. Focuses on the important transformations that ultimately control the microstructures and properties of crystalline solids. Cross-listed with ME 134.

MSE 135 Introduction to Inorganic Material Synthesis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MSE 001, CHE 100, ME 114, CHEM 008A; or consent of instructor. Introduction to the synthesis methods of modern materials. Topics include solid-state reactions, gas-phase and solution phase synthesis, templating methods, synthesis and modification of inorganic polymers, semiconductor thin-film deposition, and the growth of nanomaterials.

MSE 136 Tissue Engineering 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): BIOL 005B; CHEM 001C or CHEM 01HC; BIEN 140A or CEE 140A; restricted to class level standing of junior, or senior; or consent of instructor. Covers progress in cellular and molecular biology and engineering. Provides the basis for advancing tissue repair and regeneration with the goal of restoring compromised tissue functions. Presents methods for cell culture, tissue design and development, manipulation of the cell/tissue microenvironment, and current strategies for functional reconstruction of injured tissues. Cross-listed with BIEN 136.

MSE 141 Introduction to Microelectromechanical Systems (mems) Technology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MSE 001; restricted to class level standing of junior, or senior; or consent of instructor. Covers the fundamentals of MEMS technology including MEMS device design, fabrication, and characterization. Provides hands-on experience in crafting real MEMS devices from initial design to the

prototyping stage. Cross-listed with ME 151.

MSE 142 Corrosion Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MSE 134; restricted to class level standing of senior; or consent of instructor. Introduces the principles of corrosion in metals and alloys. Discusses the relevant elements of electrochemistry, electrochemical corrosion, thermodynamics, and the kinetic aspects of corrosion. Includes projects that provide practical hands-on experience using state-of-the-art computational techniques in materials science. Credit is awarded for one of the following MSE 142 or MSE 233A.

MSE 143 Failure Analysis and Prevention 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 114 with a grade of C or better; restricted to class level standing of senior; or consent of instructor. Topics include failure modes due to overload, fatigue, fracture, and creep. Also addresses statistical analysis, probability of failure, quality assurance, and elements of fracture mechanics. Cross-listed with ME 157. Credit is awarded for one of the following ME 157, MSE 143, or MSE 233B.

MSE 146 Metallurgical Processing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 114 with a grade of C- or better or MSE 002A with a grade of C- or better; MSE 002B with a grade of C- or better; MSE 002C with a grade of C- or better. Covers traditional and modern metallurgical processing techniques such as refining, melting, casting, forging, rolling, welding, soldering, heat treatment, and powder processing including additive manufacturing approaches. Also covers physical principles, processing details and processing equipment, and common applications.

MSE 148 Advanced Solidification Processing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MSE 143 or ME 157; restricted to class level standing of senior; or consent of instructor. An overview of the fundamentals of solidification processing. Includes integrated interplay of heat flow, mass transport, and solid/liquid interfacial kinetics during discontinuous change of state from liquid to solid of single phase and polyphase materials. Cross-listed with ME 158. Credit is awarded for one of the following MSE 148, ME 158, ME 279, or MSE 248C.

MSE 155 Materials Science of the Solid State 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 138. Explores at an advanced level the quantum mechanical behavior of electron motion and atom vibration in a periodic solid and their effect on the electronic and thermal properties of matter. The course discusses modern materials science research problems. Credit is awarded for one of the following MSE 155 or MSE 211.

MSE 156 Atomistic Modeling of Solid State Materials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MSE 155; restricted to class level standing of senior; or consent of instructor. Introduces a basic understanding of computational methods in materials science. Emphasizes the fundamentals of density functional theory and its use in the solid-state context. Includes projects that provide practical hands-on experience using state-of-the-art computational techniques in materials science. Credit is awarded for one of the following MSE 156 or MSE 224.

MSE 160 Nanostructure Characterization Laboratory 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ME 114. Covers structure of materials at the nanoscale, including semiconductors, ceramics, metals, and carbon nanotubes. Explores relationships among morphology, properties, and processing. Addresses primary methods of characterization, including scanning electron microscopy, scanning probe microscopy, X-ray diffraction, and transmission electron microscopy. Also covers elementary discussions of X-ray, vibrational, and electron waves in solids and introductory diffraction theory.

MSE 161 Analytical Materials Characterization 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MSE 160. Analysis of the surfaces of materials via ion, electron, and photon spectroscopies. Covers Rutherford back scattering; secondary ion mass spectroscopy; electron energy loss spectroscopy; Auger electron spectroscopy; X-ray photoelectron spectroscopy; photoluminescence; extended X-ray absorption fine structure; Fourier transform infrared spectroscopy; Raman spectroscopy; sputtering; high-vacuum generation; and focused ion beam milling. Cross-listed with EE 161.

MSE 175A Senior Design 4 Lecture, 2 hours; discussion, 1 hour; practicum, 3 hours. Prerequisite(s): restricted to class level standing of senior; restricted to major(s) Materials Science and Engineer. Covers preparation of formal engineering reports and statistical analysis on series of problems illustrating methodology from various branches of applied MSE. Addresses the following design process elements; problem definition; generation specification; documentation; review process; prototype fabrication; testing and calibration; cost estimation; and federal guidelines. Term project and oral presentation required. Graded In-Progress (IP) until MSE 175A and MSE 175B are completed, at which time a final, letter grade is assigned.

MSE 175B Senior Design 4 Lecture, 3 hours, discussion, 1 hour; practicum, 6 hours. Prerequisite(s): MSE 175A; senior standing in Materials Science and Engineering. Covers preparation of formal engineering reports and statistical analysis on a series of problems illustrating methodology from various branches of applied materials science and engineering. Addresses the entire design process: design problem definition; generation of a design specification; documentation; design review process; prototype fabrication; testing and calibration; cost estimation; and federal guidelines. Requires a term project and oral presentation. Satisfactory (S) or No Credit (NC) grading is not available.

MSE 197 Research For Undergraduates 1 to 4 Laboratory, 3 to 12 hours. Prerequisite(s): sophomore or junior or senior standing in Materials Science and Engineering or consent of instructor. Research conducted under the supervision of a MSE faculty member on selected problems in materials science and engineering supporting the focus area of the student. Course is repeatable to a maximum of 8 units; maximum of 4 units may count toward the technical elective requirement.

Graduate Courses

MSE 200 Graduate Studies in Materials Science and Engineering 4 Lecture, 4 hours. Prerequisite(s): Restricted to major(s) Materials Science and Engineer; graduate standing; or consent of instructor. Introduces the fundamentals of materials science and engineering including materials selection, processing, and manufacturing. Utilizes materials design, selection-based approach, and team activities to enhance learning and presentations. Provides information on how to research and survey literature and make technical presentations.

MSE 201 Thermodynamic Foundations of Materials 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing in Materials Science and Engineering or consent of instructor. MSE 201 online section; enrollment in the Online Master-in-Science in Engineering program. Covers the laws of thermodynamics and fundamental equations for multi-component elastic solids, electromagnetic media, and equilibrium criteria. Describes applications to solution thermodynamics, point defects in solids, elastic effects, phase diagrams, transitions, and interfaces. Includes nucleation theory, kinetics (diffusion of heat, mass, and charge), and coupled flows.

MSE 204 Thermodynamics and Statistical Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Covers thermodynamics, statistical mechanics, ideal Bose systems, ideal Fermi systems, and bulk motion. Cross-listed with PHYS 212A.

MSE 205 Advanced Physical Chemistry: Thermodynamics 3 Lecture, 3 hours. Prerequisite(s): CHEM 110A and CHEM 110B with grades of "C" or better. Covers concepts in thermodynamics including fundamental equations, potentials, Maxwell relations, and stability criteria. Cross-listed with CHEM 201D.

MSE 207 Applied Quantum Mechanics 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): MATH 046, PHYS 040A; or consent of instructor. Covers topics in quantum mechanics including Schroedinger equation; operator formalism; harmonic oscillator; quantum wells; spin, bosons, and fermions; solids; perturbation theory; Wentzel-Kramers-Brillouin approximation; tunneling; tight-binding model; quantum measurements; quantum cryptography; and quantum computing. Cross-listed with EE 201.

MSE 208A Plasma-Aided Manufacturing and Materials Processing 4 Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. For ME 274/MSE 208A online section: enrollment in the Online Master-in-Science in Engineering program; graduate standing. Covers the fundamentals of gaseous plasmas and the physics of both equilibrium and non-equilibrium discharges. Explores the basic techniques for plasma diagnostics. Discusses the use of plasmas as a materials processing medium for a variety of manufacturing processes. Includes topics such as the processing of nanostructured materials using plasmas. Cross-listed with ME 274.

MSE 208B Nanoscale Heat Transfer and Energy Conversion 4 Lecture, 4 hours. Prerequisite(s): 2 of the following: MSE 207, ME 100A, ME 116A, EE 201, EE 202, MSE 217; or equivalents; graduate standing. Explores fundamental processes of energy transport and conversion at short length and time scales. Introduces classical and quantum-mechanical size effects on electrons, phonons, and photons. Topics include modes of energy storage, coupling between energy carriers, and electrical and thermal transport using the Boltzmann transport equation and/or kinetic theory. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with ME 244.

MSE 210 Crystal Structure and Bonding 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing in Materials Science and Engineering or consent of instructor. MSE 210 online section; enrollment in the Online Master-in-Science in Engineering program . Covers regular and irregular arrays of points and spheres. Includes lattices (direct and reciprocal); crystallographic point and space groups; and atomic structures. Also addresses bonding in molecules and solids, ionic Pauling rules; and covalent and metallic bonding. Surveys the structure of elements, compounds, minerals, and polymers.

MSE 211 Materials Science of the Solid State 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Explores at an advanced level the quantum mechanical behavior of electron motion and atom vibration in a periodic solid and their effect on the electronic and thermal properties of matter. The course discusses modern materials science research problems. Credit is awarded for one of the following MSE 211 or MSE 155.

MSE 212 Quantum Electron Transport 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 208 or MSE 227B; graduate standing; or consent of instructor. Covers the theory and methods used to model quantum electron transport in ultrascaled traditional semiconductor devices such as transistors, nanoscaled research semiconductor devices (such as quantum dots), and novel electronic material systems (such as carbon nanotubes and molecular wires.) May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 212.

MSE 214 Condensed Matter Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 221C; graduate standing; or consent of instructor. Topics include classical and quantum theories of the electron gas; crystal and reciprocal lattices; crystal symmetries; electrons in a periodic potential; nearly free electrons; tight binding; band structure; metals, insulators and semiconductors; semiclassical dynamics; and semiclassical transport. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with PHYS 240A.

MSE 217 Fundamentals of Semiconductors and Nanostructures 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 133, EE 201/MSE 207; graduate standing; or consent of instructor. Examines principles of semiconductor materials and nanostructures. Topics include periodic structures, electron and phonon transport, defects, optical properties, and radiative recombination. Also covers absorption and emission of radiation in nanostructures and nonlinear optics effects. Emphasizes properties of semiconductor superlattices, quantum wells, wires, and dots. Cross-listed with EE 202.

MSE 218 Imperfections in Solids 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers fundamentals of crystal structures and crystal defects. Includes the generation of point defects, nucleation and propagation of dislocations, perfect and partial dislocations, twins, stacking faults, transformations, mechanics of semiconductor and metallic thin films, and multilayered structures. Cross-listed with ME 278.

MSE 220 Materials Characterization Techniques 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in Materials Science and Engineering or consent of instructor. Covers basic principles of techniques used in the characterization of engineering materials by electron microscopy, diffraction, and spectroscopy. Provides analysis of defects responsible for materials properties. Addresses modern electrical, optical, and particle beam techniques for material characterization. Includes Hall Effect and Raman spectroscopy.

MSE 221 Electron Microscopy and Microanalysis 3 Lecture, 3 hours. Prerequisite(s): graduate standing in Materials Science & Engineering or consent of instructor. Introduces electron microscopy and microanalysis of inorganic solids including synthetic nanomaterials and minerals. Provides the underlying physical principles of electron microscopy and microanalysis; the strengths and limitations of the method; and the potential applications in characterization of morphology, structure, composition, and defects of inorganic materials and nanostructures. Optional, related laboratory courses are available: MSE 222L, MSE 223L.

MSE 222L Laboratory in Transmission Electron Microscopy 1 Laboratory, 2 hours; written work, 1 hour. Prerequisite(s): Concurrent or previous enrollment in MSE 221 or consent of instructor. Provides practical training in transmission electron microscopy and associated techniques including sample preparation.

MSE 223L Laboratory in Scanning Electron Microscopy 1 Laboratory, 2 hours; written work, 1 hour. Prerequisite(s): Concurrent or previous enrollment in MSE 221 or consent of instructor. Provides practical training in scanning electron microscopy and associated techniques including sample preparation.

MSE 224 Atomistic Modeling of Solid State Materials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 138 or MSE 211 or PHYS 150A; graduate standing; or consent of instructor. Introduces computational methods in materials science. Emphasizes fundamentals of density functional theory and its use in the solid-state context. Includes projects that provide practical hands-on experience. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory(S) or No Credit(NC) grade. Credit is awarded for one of the following MSE 224 or MSE 156.

MSE 225A Spectrometry in Organic Structure Analysis 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Utilizes modern spectroscopic techniques such as IR, mass spectrometry, and 1H and 13C NMR to determine the structure of complex organic molecules. Topics include advanced NMR techniques such as 2D NMR, NMR pulse sequences, diffusion NMR, and MRI. Cross-listed with CHEM 211D.

MSE 225B Advanced Analytical Chemistry: Optical Spectroscopy 3 Lecture, 3 hours. Prerequisite(s): CHEM 125; graduate standing; or consent of instructor. Provides an overview of modern analytical optical spectroscopic techniques including theory, instrumentation, and applications. Cross-listed with CHEM 221B.

MSE 225C Introduction to Computational Quantum Chemistry 3 Lecture, 3 hours. Prerequisite(s): CHEM 113 or equivalent, graduate standing; or consent of instructor. Introduces computational techniques in quantum chemistry. Includes Hartree-Fock theory, Density Functional Theory, and electron correlation methods. Emphasizes practical applications in a research setting. Cross-listed with CHEM 206A.

MSE 226 Optical Methods in Biology, Chemistry, and Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 109 or equivalent; graduate standing; consent of instructor. Covers the origin of fluorescence and other emission processes that modulate the characteristics of molecular emissions. Presents emission-based analytical and bioanalytical methods and techniques. Reviews state-of-the-art instrumentation, including their applicability, limitations, and source. Also provides interpretation and meaning of the measured signals as applied to biological systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes. Cross-listed with BIEN 245.

MSE 227A Nanoscale Characterization Techniques 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 201 or MSE 207; graduate standing; or consent of instructor. An in-depth study of nanoscale materials and device characterization techniques. Emphasizes atomic force microscopy (AFM) and scanning tunneling microscopy (STM). Includes semiconductor fabrication fundamentals; metrology requirements; in situ monitoring; interconnects and failure analysis; principles of AFM, STM, and scanning electron microscopy; X-ray methods; optical and infrared techniques; and electrical characterization. Cross-listed with EE 206.

MSE 227B Semiconductor Electronic and Optical Properties 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 221B, may be taken concurrently or EE 202, may be taken concurrently or MSE 217, may be taken concurrently; graduate standing. Introduction to electronic bandstructure. Topics include electronic structure of semiconductors, graphene, localized orbital models, k dot p models, spin-orbit coupling, and optical generation of spin. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 208.

MSE 229 Advanced Computation For Materials Design 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers both desktop computing and high-performance computing (i.e., supercomputing resources) in the engineering sciences to understand and design materials using computational methods. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CEE 240.

MSE 230 Functional Materials: Semiconductors 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing in Materials Science and Engineering or consent of instructor. Covers semiconductor crystal growth techniques; purification; doping; radiation damage; annealing; metal-semiconductor interfaces; defects and impurities; and major electronic and optical methods for the analysis of semiconductors. Includes semiconductor device fabrication issues.

MSE 233A Corrosion Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MSE 233A online section; enrollment in the Online Master-in-Science in Engineering program. MSE 233A in-person section; graduate standing; or consent of instructor. Introduces the principles of electrochemistry and the essential elements of electrochemical corrosion, thermodynamics, and kinetic aspects of Material Sciences. Provides a fundamental understanding of the mechanisms of corrosion, testing, and protection as well as the influence of pH, dissolved gases, dissolved salts, temperature, and biological microorganisms. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following MSE 233A or MSE 142.

MSE 233B Failure Analysis and Prevention 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MSE 233B online section; enrollment in the Online Master-in-Science in Engineering program. MSE 233B in-person section; graduate standing; or consent of instructor. Introduces the principles of failure analysis and prevention, emphasizing the influence of defects produced during casting, forming, and welding. Provides a fundamental understanding of overload failure modes, fatigue and fracture toughness, and creep. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following MSE 233B, ME 157, or MSE 143.

MSE 234A Physics of Nanoscale Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduction to fundamental quantum physics in nanoscale systems and low dimensional materials. Including synthesis of low-dimensional material systems; physics-based experimental approaches to nanotechnology; mesoscopic quantum transport of electrons; quantum phenomena involving spin; silicon nanoelectronics and beyond; and future electronics based on topological materials. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with PHYS 234.

MSE 234B Spintronics and Nanoscale Magnetism 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Provides an overview of contemporary issues in nanoscale magnetism and spin-dependent phenomena in solids, including the fundamentals of magnetism, magnetism in reduced dimensions, novel magnetic materials, spin-polarized transport, spin coherence in semiconductors, magnetization dynamics, and device applications. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with PHYS 235.

MSE 235 Solid State and Materials in Inorganic Chemistry 3 Lecture, 3 hours. Prerequisite(s): CHEM 231A/MSE 245B or consent of instructor. Covers the advanced synthesis, structure, bonding, and properties of inorganic materials. Cross-listed with CHEM 231C.

MSE 236 Nanomaterials For Regenerative Medicine 4 Lecture, 4 hours. Prerequisite(s): BIOL 005C, CHEM 001C (or CHEM 01HC), MSE 001, or equivalents; graduate standing or consent of instructor. Covers recent advances in nanomaterial synthesis, fabrication, and characterization. Focuses on the medical applications of nanomaterials and nanotechnologies. Addresses methods of synthesis of nanomaterials such as nanoparticles, nanotubes, and nanofibers. Includes critical design criteria and assessment methods for properties of nanomaterials to meet medical requirements. Cross-listed with BIEN 236.

MSE 237A Quantum Magnetism 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduces fundamental physical properties of magnetism and quantum behavior of magnetic materials for the understanding of modern magnetic devices. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 220A.

MSE 237B Nanoscale Phonon Engineering 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 202 or MSE 217; graduate standing. Studies acoustic and optical phonons that affect electrical, thermal, and optical properties of materials. Focuses on the confinement-induced changes of phonon properties in nanostructures and their implications for performance of electronic, thermoelectric, and optoelectronic devices. Explores phonon theory, Raman spectroscopy and other phonon characterization techniques, thermal conductivity, and related measurements. Cross-listed with EE 216.

MSE 237C Solid State Devices 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): EE 133; graduate standing; or consent of instructor. Covers electronic devices including p-n junctions, field-effect transistors, heterojunction bipolar transistors, and nanostructure devices. Explores electrical and optical properties of semiconductor heterostructures, superlattices, quantum wires, and dots, as well as devices based on these structures. Cross-listed with EE 203.

MSE 238 Introduction to Microelectromechanical Systems 4 Lecture, 4 hours. Prerequisite(s): ME 110, ME 114, or equivalents; for MSE 238 online section; enrollment in the Online Master-in-Science in Engineering program. An introduction to the design and fabrication of microelectromechanical systems (MEMS). Topics include micromachining processes; material properties; transduction; applications in mechanical, thermal, optical, radiation, and biological sensors and actuators; microfluidic devices; Bio-MEMS and applications; packaging and reliability concepts; and metrology techniques for MEMS. Cross-listed with ME 270.

MSE 239A Fundamentals of Heterogeneous Catalysis 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): CEE 204; graduate standing; or consent of instructor. Explores fundamental phenomenon of chemical reactivity on ground and excited state potential energy surfaces. Quantitatively relates electronic structure of catalytic materials to their chemical reactivity. Covers state-of-the-art experimental and theoretical approaches to studying catalytic reactivity. Provides a holistic understanding of catalysis at an atomic scale. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CEE 222, and CHEM 222.

MSE 239B Synthesis and Characterization of Nanomaterials 3 Lecture, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers key concepts in synthesis and characterization techniques of nanoscale materials. Explores top down and bottom-up strategies for synthesizing low-dimensional nanomaterials and common techniques for

nanoscale materials characterization. Also covers fundamental chemical principles of bonding, electronic structure, and atomic arrangements. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CEE 224.

MSE 239C Electrochemical Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. For CEE 235/MSE 239C online section; enrollment in the Online Master of Science in Engineering program; graduate standing. Explores the role of thermodynamics, charge transfer kinetics, and mass transfer on the behavior of electrochemical systems. Includes cell thermodynamics, Faradaic and non-Faradaic rate processes, ionic transport, nucleation, and growth theories. Covers applications to chemical sensors, batteries, corrosion, and thin film deposition. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CEE 235.

MSE 240 Materials Synthesis and Processing 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers synthesis of functional materials and materials processing. Functional materials include semiconductors, metals, polymers, and nanoscaled-materials such as nanotubes and nanoparticles. Focuses on methods of semiconductor fabrication and their physical and chemical foundation.

MSE 245A Advanced Organic Reactions 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers modern organic reactions and reagents and their mechanistic pathways with emphasis on recent developments and practical organic chemistry. Cross-listed with CHEM 211E.

MSE 245B Structure and Bonding in Inorganic Chemistry 3 Lecture, 3 hours. Prerequisite(s): CHEM 150A, CHEM 150B. Covers advanced synthesis, structure, and bonding in inorganic, coordination, and organometallic chemistry. Cross-listed with CHEM 231A.

MSE 245C Nanoscience and Nanotechnology 3 Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry, Physics, Engineering, or a related subject or consent of instructor. Provides a condensed, interdisciplinary overview of selected fields of nanoscience and emerging nanotechnological applications. Focuses on applications relevant for the campus research community that are not based on electronic applications of silicon. Cross-listed with CHEM 203.

MSE 245D Interdisciplinary Overview of Current Issues in Semiconductor Processing 3 Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry, Physics, Engineering, or a related subject or consent of instructor. An interdisciplinary overview of present-day semiconductor processing. Introduces topics such as properties of semiconductors, cleanroom environment, epitaxy, ion implantation, etching, lithography, device architecture, testing, and fault detection. May offer field trips. Cross-listed with CHEM 208, and PHYS 202.

MSE 246 Cellular and Molecular Engineering 4 Lecture, 2 hours; discussion, 1 hours; practicum, 3 hours. Prerequisite(s): graduate standing or consent of instructor. BIEN 224 online section; enrollment in the Online Master-in-Science in Engineering program. Emphasizes biophysical and engineering concepts intrinsic to specific topics at the cellular and molecular level. Includes receptor-ligand dynamics in cell signaling and function; DNA replication and RNA processing; cellular and protein sorting; control of gene expression; membrane structure, transport and traffic; biological signal transduction; and mechanics of cell division. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with BIEN 224.

MSE 248A Nanoscale Science and Engineering 4 Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. For the MSE 248A/ME 272 online sections: enrollment in the Online Master-in-Science in Engineering program; graduate standing. An overview of the machinery and science of the nanometer scale. Topics include patterning of materials via scanning probe lithography; electron beam lithography; nanoimprinting; self-assembly; mechanical, electrical, magnetic, and chemical properties of nanoparticles, nanotubes, nanowires, and biomolecules (DNA, protein); self-assembled monolayers; and nanocomposites and synthetic macromolecules. Cross-listed with ME 272.

MSE 248B Mechanics and Physics of Materials 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Course introduces students to topics related to Structure-Composition-Processing-Performance relationship of metallic materials. It will cover fundamentals of materials science, materials selection, processing and manufacturing. Materials design or selection-based approach and team activities will be utilized to enhance learning and presentation skills. Cross-listed with ME 266.

MSE 248C Advanced Solidification Processing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MSE 134 or ME 134; graduate standing; or consent of instructor. An overview of the fundamentals of solidification processing. Includes integrated interplay of heat flow, mass transport, and solid/liquid (s/l) interfacial kinetics during discontinuous change of state from liquid to solid of single phase and polyphase materials. Cross-listed with ME 279. Credit is awarded for one of the following MSE 248C, ME 279, ME 158, or MSE 148.

MSE 250 Colloquium in Materials Science and Engineering 1 Colloquium,1 hour. Prerequisite(s): graduate standing in Materials Science and Engineering or consent of instructor. Presentations on current topics in Materials Science and Engineering presented by invited speakers, UCR faculty, and graduate students. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

MSE 251 Topics in Materials Science and Engineering 1 Seminar, 1 hour. Prerequisite(s): graduate standing in Materials Science & Engineering or consent of instructor. Presentations on current topics in Materials Science and Engineering by special speakers, UCR faculty, and graduate students. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 21 units.

MSE 280 Special Topics in Biomaterials and Tissue Engineering 1 to 2 Seminar, 1 to 2 hours; term paper, 0 to 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on advanced biomaterials and tissue engineering for medical applications. Explores the design, processing, characterization, and evaluation of biomaterials. Examines current development in novel materials and recent advances in their applications in tissue engineering, drug delivery, gene therapy, cell therapy, medical devices, and implants. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as content changes to a maximum of 30 units. Cross-listed with BIEN 272.

MSE 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual study directed by a faculty member on selected topics in Materials Science and Engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units

MSE 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Research conducted under the supervision of a faculty member on selected topics in Materials Science and Engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MSE 298I Individual Internship in Materials Science & Engineering 1 to 12 Internship, 2 to 24 hours; written work, 1 to 12 hours. Prerequisite(s): graduate standing; consent of instructor. Provides the Materials Science & Engineering graduate student with career experience as an engineer in an industrial or national lab setting. Includes fieldwork with an approved professional individual or organization and academic work under the direction of a faculty member. Requires a final report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

MSE 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): consent of instructor; graduate standing Research in materials science and engineering for the M.S. thesis or Ph.D. dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

MSE 302 Teaching Practicum 1 to 2 Consultation 1 to 2, Prerequisite(s): appointment as a teaching assistant in Materials Science and Engineering; graduate standing; consent of instructor and graduate advisor. Topics include effective teaching methods, such as those involved in leading discussion sections and preparing and grading examinations, as well as student-instructor relations in lower- and upper-division Materials Science and Engineering courses. Required each quarter of teaching assistants and associates in Materials Science and Engineering. Graded Satisfactory (S) or No Credit (NC).

Mathematics

Subject abbreviation: MATH
College of Natural and Agricultural Sciences

James Kelliher, Ph.D., Chair
Department Office, 224 Skye Hall
(951) 827-3113; mathdept.ucr.edu

Professors

Mark Alber, Ph.D., *Distinguished Professor*
Vyjayanthi Chari, Ph.D., *Distinguished Professor, F. Burton Jones Endowed Chair*
Wee Liang Gan, Ph.D.
Jacob Greenstein, Ph.D.
James Kelliher, Ph.D.
Yat Sun Poon, Ph.D.
Ziv Ran, Ph.D.
Rodolfo Torres, Ph.D., *Distinguished Professor*
Stefano Vidussi, Ph.D.
Frederick H. Wilhelm, Jr., Ph.D.
Feng Xu, Ph.D.
Qi S. Zhang, Ph.D.

Professor of Teaching

Estela Gavosto, Ph.D.

Professors Emeriti

John C. Baez, Ph.D.
Richard E. Block, Ph.D.
Mei-Chu Chang, Ph.D.
John E. de Pillis, Ph.D.
Gerhard Gierz, Ph.D.
Zhuang-dan Guan, Ph.D.
Michel L. Lapidus, Ph.D., *Distinguished Professor Emeritus*
Frederic T. Metcalf, Ph.D.
Malempati M. Rao, Ph.D.
Louis J. Ratliff, Jr., Ph.D.
Reinhard Schultz, Ph.D.
James D. Stafney, Ph.D.
Albert R. Stralka, Ph.D.
Bun Wong, Ph.D.

Associate Professors

Po-Ning Chen, Ph.D.
Weitao Chen, Ph.D.
Brian Collier, Ph.D.
Jose Gonzalez, Ph.D.
Carl Mautner, Ph. D.
Amir Moradifam, Ph.D.
Maziar Raissi, Ph.D.
Peter Samuelson, Ph.D.
Qixuan Wang, Ph.D.
Zhenghe Zhang, Ph.D.

Associate Professors of Teaching

Kevin Costello, Ph.D.
Sara Lapan, Ph.D.
David Weisbart, Ph.D.

Assistant Professors

Thomas Bury, Ph.D.
Patricio Gallardo Candela, Ph.D.
Yat Tin Chow, Ph.D.
Tom A. Gannon, Ph.D.
Jia Gou, Ph.D.
Siting Liu, Ph.D.
Mykhailo Potomkin, Ph.D.
Yiwei Wang, Ph.D.
Morgan Weiler, Ph.D.
Agnieszka Zelerowicz, Ph.D.

Assistant Professor of Teaching

Jeffrey Meyer, Ph.D.
Sarah Yeakel, Ph.D.

**

Adjunct Assistant Professor

Heyrim Cho, Ph.D.

Visiting Assistant Professors

Esther Banaian, Ph.D.
David Clausen, Ph.D.
Liping Deng, Ph.D.
Becky Eastham, Ph.D.
Pallav Goyal, Ph.D.
Hussain Ibdah, Ph.D.
Hamid Naderiyan, Ph.D.
Ivo Terek, Ph. D.
Boris Tsvelikhovskiy, Ph.D.
William Wood, Ph.D.
Keija Zhu, Ph.D.

Lecturer

Michael Curtis

Cooperating Faculty

Bai-Lian "Larry" Li, Ph.D. (Botany and Plant Sciences)

Academic Coordinator

Brandon Coya, Ph.D.
Savanna Gee, Ph.D.

Major

The Department of Mathematics offers a B.A. and B.S. degree in programs that share a common, solid mathematical foundation but differ in their specializations in the pure and applied areas of mathematics. These programs can provide the basis for careers in mathematics itself or within the many scientific and business fields, which, in today's technological society, depend on a basic knowledge of mathematical methods.

The **B.A. in Mathematics**, following the liberal arts tradition, combines a broad coverage of the humanities and social sciences with a moderate amount of advanced mathematics in the major. It is selected most often either by students who intend to obtain a teaching credential with a specialty in mathematics or by students who wish to pursue graduate work in business or the social sciences.

The **B.S. in Mathematics** is more technical and contains a greater concentration of work in the major field. The Pure Mathematics program is directed toward students who may wish to pursue graduate work in pure mathematics. The General Applied Math option is directed toward students who may wish to pursue graduate work in applied mathematics.

The other Applied Mathematics programs, with options in Biology, Chemistry, Economics, Environmental Sciences, Physics, and Statistics, are designed to provide a rigorous training in mathematics together with a substantial background in the discipline of the option. The Computational Mathematics program is designed to prepare the student for professional work with computers and computer systems and for graduate work in computer science.

The **B.S. in Mathematics for Secondary Teachers** is intended for students planning to pursue a career in secondary education. Its courses cover the high school curriculum from an advanced perspective. Students are required to complete mathematics education and education courses in order to facilitate presence in the classroom early in their undergraduate career and to better prepare them for entry in a credential program.

Academic Advising

Each Mathematics major is assigned a faculty advisor who assists the student in formulating educational goals and monitors the student's subsequent progress in an academic program. Each quarter a study list must be approved by this advisor. Advising for all math majors is conducted by the CNAS Academic Advising Center in 1223 Pierce Hall.

Teaching Credential

Teachers in the public schools in California must have a credential approved by the State Commission on Teacher Credentialing. The credential requires an undergraduate major, baccalaureate degree, and completion of a graduate credential program such as that offered by the School of Education at UCR (see Education in this catalog). The Bachelor of Science in Mathematics for Secondary Teachers assists students in their preparation to face the challenges of a credentialing program.

Before admission and student teaching in a graduate credential program, the candidate must pass the California Basic Education Skills Test (CBEST) and demonstrate subject-matter proficiency in the fields which the candidate will teach. The candidate can demonstrate proficiency either by passing the commission's subject-matter assessment examination or completing an undergraduate program that is state approved for teacher preparation.

California Teach-Science and Mathematics Initiative (CalTeach-SMI)

California Teach-Science and Mathematics Initiative (CalTeach-SMI) has a goal of addressing the critical need of highly qualified K-12 science and mathematics teachers in California. With an economy increasingly reliant on science, technology, engineering, and mathematics (STEM) and the anticipated large scale retirement of qualified teachers, this is an essential time to explore and prepare for a career in teaching science or mathematics.

CalTeach-SMI at UCR offers undergraduate students paid/unpaid opportunities, such as the Scholar Apprentice Program, to explore STEM teaching as a career option. Through CalTeach-SMI, students receive advising and mentoring to prepare for entrance into an intern teaching credential program while diligently coordinating with academic advisors to ensure completion of STEM degree requirements.

The CalTeach-SMI Resource Center provides future STEM teachers with material and financial resources to promote planning and professional development towards a science/mathematics education career.

For more information about the CalTeach-SMI program, please visit **smi.ucr.edu**, the Resource Center at 1114 Pierce Hall, or on Facebook at **facebook.com/ScienceMathInitiativeAtUcr** and on Instagram at **instagram.com/smiatucr/**.

Change of Major Criteria

All courses taken to fulfill major requirements must be completed with grades of C- or better after repeats.

Freshman (0-44.9 units earned)

Completion of the following with grade of "C-"or better and must be in good academic standing. (2.0 quarter and cumulative GPA).

MATH 005B or MATH 007A or MATH 009A or MATH 009HA

Sophomores (45-89.9 earned units)

Completion of the following three criteria with grade of "C-"or better and must be in good academic standing. (2.0 quarter and cumulative GPA).

- MATH 005B or MATH 007A or MATH 009A or MATH 009HA
- MATH 005C or MATH 007B or MATH 009B or MATH 009HB
- MATH 005C or MATH 009C or MATH 010A

Juniors & Seniors (90 or more earned units)

Completion of the following five criteria with grade of "C-"or better and must be in good academic standing. (2.0 quarter and cumulative GPA).

- MATH 005B or MATH 007A or MATH 009A or MATH 009HA
- MATH 005C or MATH 007B or MATH 009B or MATH 009HB
- MATH 005C or MATH 009C
- MATH 010A
- MATH 031

Major change requests are reviewed during the 2nd, 3rd, 4th & 10th weeks of each quarter. Students are required to complete degree programs without exceeding 216 earned units.

Transfer Selection Criteria

Applicants to majors in the College of Natural and Agricultural Sciences are selected on the basis of academic preparation, as assessed by their GPA and the strength of preparation for the intended major. A GPA of at least 2.70 is required. (This is a baseline GPA for consideration and not a guarantee of admission.)

In addition, applicants will need to complete college courses comparable to at least two of the following UCR year-long sequences in order to meet selection criteria for this major. Courses must be completed with "C" grades or better:

At least one sequence from:

1. MATH 007A or MATH 009A, MATH 007B or MATH 009B, and MATH 009C (mandatory)
2. MATH 005A, MATH 005B, MATH 005C (mandatory)

And at least one sequence from:

1. BIOL 005A/BIOL 05LA and BIOL 005B (and BIOL 005C, if articulated)
2. CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, and CHEM 01LC
3. PHYS 040A, PHYS 040B, and PHYS 040C
4. MATH 010A, MATH 010B, and MATH 045/ EE 020A or MATH 046

Courses must be completed with a letter grade, with no grade lower than a "C." Students should visit **assist.org** for updated and comprehensive major preparation requirements.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Major Requirements for the Bachelor of Arts and Bachelor of Science in Mathematics

To fulfill the Natural Sciences requirement, the Department of Mathematics requires the following:

1. One of the year sequences:
   a) BIOL 002, BIOL 003, BIOL 005C
   b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC,
   c) PHYS 040A, PHYS 040B, PHYS 040C
2. Either one course in the physical sciences listed above if (a) above is completed or one course in the biological sciences if (b) or (c) above is completed

The major requirements for the B.A. and B.S. degrees in Mathematics are as follows:

For the Bachelor of Arts

1. Lower-division requirements (25-27 units)
   a) MATH 005B or MATH 007A or MATH 009A or MATH 09HA
   b) MATH 005C or MATH 007B or MATH 009B or MATH 09HB
   c) MATH 010A, MATH 010B, MATH 031
   d) MATH 045/EE 020A or MATH 046
2. Four (4) units of either CS 010A or one upper-division course in Statistics
3. A minimum of 36 units of upper-division mathematics, excluding courses in the MATH 190–199 series

For the Bachelor of Science

Lower-division requirements for all programs are (33-36 units)

   a) MATH 005B or MATH 007A or MATH 009A or MATH 09HA
   b) MATH 005C or MATH 007B or MATH 009B or MATH 09HB
   c) MATH 005C or MATH 009C
   d) MATH 010A, MATH 010B, MATH 031
   e) MATH 045/EE 020A or MATH 046
   f) CS 010A (CS 010B is recommended)

1. **Pure Mathematics program** (52 units)
   a) MATH 110, MATH 131, MATH 151A, MATH 151B
   b) Thirty-six (36) additional units of upper-division mathematics or other related courses approved by the undergraduate advisor
   c) At least three courses from (b) above must be from MATH 132, MATH 145A, MATH 145B, MATH 151C, MATH 171, MATH 172 (For students who wish to pursue graduate work, MATH 132, MATH 145A, MATH 145B, MATH 151C, MATH 165A, MATH 165B, MATH 171, and MATH 172 are recommended)
   d) Courses in the MATH 190-199 series are excluded
2. **Applied Mathematics programs** (MATH 135A and MATH 135B) or (MATH 149A and MATH 149B), MATH 110, MATH 131, MATH 146A, MATH 146B, MATH 146C and the courses in one of the following options:
   a) General Applied Mathematics option
      (1) MATH 150 or MATH 151A
      (2) MATH 168
      (3) Students will select sixteen (16) additional units from MATH 120, MATH 121, MATH 126, MATH 135A, MATH 135B, MATH 135C, MATH 147, MATH 148, MATH 149A, MATH 149B, MATH 151B, MATH 161, MATH 162, MATH 163, MATH 165A, MATH 165B
   b) Biology option
      (1) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
      (2) MATH 149A
      (3) Two courses from MATH 120, MATH 121, MATH 135A, MATH 135B, MATH 149B
      (4) BIOL 102, BIOL 105, BIOL 108
      (5) Four (4) additional units of upper-division biology
   c) Chemistry option
      (1) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
      (2) PHYS 040A, PHYS 040B, PHYS 040C
      (3) Three courses from MATH 120, MATH 135A, MATH 135B, MATH 149A, MATH 149B, MATH 165A, MATH 165B
      (4) CHEM 110A, CHEM 110B, CHEM 111, CHEM 113
      (5) Four (4) additional units of upper-division chemistry
   d) Economics option
      (1) MATH 120, MATH 121, MATH 149A, MATH 149B
      (2) Four upper-division Economics courses (17-20 units) including:
         (a) ECON 104A
         (b) Three courses to be chosen from ECON 104B, ECON 104C, ECON 105A, ECON 105B, ECON 107, ECON 108, ECON 110, ECON 117/PHIL 119, ECON 129, ECON 134/BUS 106, ECON 135, ECON 136, ECON 153, ECON 160/BUS 160, ECON 171/BUS

171, ECON 178/BUS 178.

e) Environmental Sciences option

(1) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC

(2) ECON 006/ENSC 006

(3) GEO 001 is recommended

(4) MATH 149A

(5) Two courses from MATH 120, MATH 121, MATH 135A, MATH 135B, MATH 149B, CS 177, STAT 155

(6) ENSC 100, ENSC 101, ENSC 102

(7) Four (4) additional units of upper-division environmental sciences

f) Physics option

(1) MATH 135A, MATH 165A

(2) Either MATH 120 or MATH 171

(3) PHYS 130A, PHYS 130B

(4) Either PHYS 135A, PHYS 135B, PHYS 136 or PHYS 156A, PHYS 156B

3. **Computational Mathematics program**

a) MATH 011/CS 011, MATH 110, MATH 120, MATH 131, MATH 132, (MATH 135A and MATH 135B) or (MATH 149A and MATH 149B)

b) CS 010B, CS 010C, CS 100, CS 111

c) Twenty (20) additional units of technical electives to be chosen from (1) and (2) below. At least 12 units must be chosen from (2).

(1) MATH 121, MATH 126, MATH 135A, MATH 135B, MATH 135C, MATH 146A, MATH 146B, MATH 146C, MATH 149A, MATH 149B, MATH 150 or MATH 151A, MATH 161, MATH 162, MATH 163, MATH 171

(2) CS 130, CS 141, CS 150, CS 166, CS 167, CS 170, CS 171, CS 173, CS 177

Major Requirements for the Bachelor of Science in Mathematics for Secondary School Teachers

1. Lower-division Mathematics requirements (27-29 units)

a) MATH 005B or MATH 007A or MATH 009A or MATH 09HA

b) MATH 005C or MATH 007B or MATH 009B or MATH 09HB

c) MATH 005C or MATH 009C

d) MATH 010A, MATH 010B, MATH 031

e) MATH 045/EE 020A or MATH 046

2. Upper-division Mathematics requirements (36 units)

a) MATH 110, MATH 131, MATH 133, MATH 140, MATH 153

b) MATH 150 or MATH 151A

c) Three courses from: MATH 132, MATH 136, MATH 138A, MATH 145A, MATH 145B, MATH 149A, MATH 149B, MATH 151B, MATH 151C, MATH 165A, MATH 171, MATH 172

3. Additional Mathematics and related disciplines requirements (12 units)

a) CS 010A

b) CS 011/MATH 011

c) STAT 155

4. Natural Sciences (16-20 units)

a) BIOL 002 or BIOL 003 or BIOL 005A and BIOL 05LA

b) CHEM 001A and CHEM 01LA or CHEM 01HA and CHEM 01HLA

c) PHYS 040A

d) CHEM 001B and CHEM 01LB or CHEM 01HB and CHEM 01HLB or PHYS 040B or an additional laboratory Biological science course

5. Social Sciences (16 units)

a) One course in ECON or POSC

b) One course in ANTH

c) One course in PSYC

d) One course in SOC

6. Mathematics Education and Education requirements (18 or 19 units): EDUC 003 or EDUC 004 or EDUC 100B or equivalent, EDUC 104, EDUC 132, EDUC 147, EDUC 162

7. Recommended Courses LING 020 or LING 021, EDUC 177 or EDUC 178, EDUC 179A.

Mathematics Honors Program

Candidates for the Honors Program in Mathematics must complete

1. Earn an overall GPA of at least 3.50 in Mathematics.
2. Earn a grade of "B" or better in each of MATH 151A, MATH 151B and MATH 151C.
3. Earn a grade of "B" or better in each of MATH 145B and MATH 171 OR in each of MATH 146A, MATH 146B and MATH 146C OR in each of MATH 149A and MATH 149B.
4. Satisfactorily complete one of the following:

i) A research project earning a grade of "A" in MATH 197.

ii) Two courses chosen from one of the sequences: MATH 201A, 201B, 201C; MATH 205A, MATH 205B, MATH 205C: MATH 209A, MATH 209B, MATH 209C; MATH 210A, MATH 210B with a grade of "B" or better in each course.

It is the responsibility of the honors candidates to notify the department of their eligibility.

Minor

The following are the requirements for a minor in Mathematics.

1. Lower-division courses (18-20 units)

a) MATH 005B or MATH 007A or MATH 009A or MATH 009HA

b) MATH 005C or MATH 007B or MATH 009B or MATH 009HB

c) MATH 005C or MATH 009C

d) MATH 010A, MATH 010B

2. Upper-division requirements: 24 units of upper-division mathematics courses. Of the specified upper-division units, a minimum of 16 must be unique to the minor and may not be used to satisfy major requirements and no more than 4 units in courses numbered 190–199.

Students with a minor in Mathematics should consult with a faculty advisor in Mathematics to construct a specific program consistent with their goals.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Graduate Programs

The Department of Mathematics offers the M.A., M.S., and Ph.D. degrees in Mathematics.

Admission

A bachelor's degree, or its equivalent, from an accredited institution is required. GRE test scores are not required or considered.

M.A. or M.S. in Mathematics

General university requirements are listed in the Graduate Studies section of this catalog. Specific requirements are as follows:

1. Completion of two of the following sequences: MATH 201A, MATH 201B, MATH 201C; MATH 205A, MATH 205B, MATH 205C; MATH 206A, MATH 206B, MATH 206C, MATH 209A, MATH 209B, MATH 209C; or MATH 210A, MATH 210B, MATH 210C with a grade of "C" or better in each course and a GPA of 3.00 in each chosen sequence
2. As a substitute for one or more course sequences in (1), passing a Ph.D. qualifying examination fulfills the course requirement of the corresponding sequence
3. Taking 36 units of courses numbered between MATH 110 and MATH 189, or between MATH 200 and MATH 210. At least 18 must be from courses numbered between MATH 200 and MATH 210.
4. Completion of 2 units of MATH 401, Professional Development in Mathematics.

The requirements of 1 and 2 above constitute the comprehensive final examination requirement for the degree.

M.S. in Mathematics (Applied)

General university requirements are listed in the Graduate Studies section of this catalog. Specific requirements are as follows:

1. Completion of two sequences of courses numbered between MATH 206 and MATH 209 with a grade of "C" or better in each course and a GPA of at least 3.00 in each chosen sequence. A sequence consists of all courses with the same course number except for an alphabetical suffix. Any course without an alphabetical suffix is not part of a sequence.

2. As a substitute for one or more course sequences in (1), passing a Ph.D. qualifying examination fulfills the course requirement of the corresponding sequence.
3. Taking 36 units of courses numbered between MATH 110 and MATH 189, or between MATH 200 and MATH 210. At least 18 units must be from courses numbered between MATH 200 and MATH 210.
4. Completion of 2 units of MATH 401, Professional Development in Mathematics.

The requirements of 1 and 2 above constitute the comprehensive final examination requirement for the degree.

Doctoral Degree

The Department of Mathematics offers the Ph.D. degree in Mathematics.

Specific requirements are as follows:

1. Passing four sequences numbered between MATH 200 and MATH 210. A sequence consists of all courses with the same course number except for an alphabetical suffix. Any course without an alphabetical suffix is not part of a sequence.
2. For two of the four chosen sequences in (1), a qualifying examination must be taken. The qualifying examinations, which are associated with two of the year-long sequences, must be passed with a grade of "A".

   A student is allowed to take the qualifying examination at most twice for each sequence. Students must attempt at least one of these examinations in their 2nd year and are expected to pass both no later than the 3rd year of their Ph.D. program.
3. Completing four quarter-courses in mathematics numbered between 211 and 259.
4. The oral qualifying must be passed no later than the end of the 12th quarter of the student's graduate training. Exceptions can be made based on the approval of the Graduate Advisor. The student must pass both written qualifying exams (2) and complete the four required core sequences (1) before attempting the oral qualifying exam.
5. Advancement to candidacy occurs after a student completes requirements (1) through (4). Students must advance to candidacy before being able to defend their dissertation.

6 Completion of 2 units of MATH 401, Professional Development in Mathematics.

7. Having completed requirements (1) through (6), a student must write and defend their dissertation.
8. The acceptable modalities for the oral qualifying exam and dissertation defense are:

   a) In-person;

   b) Hybrid, provided the student and at least two committee members attend in person. If the Chairperson is attending remotely, a committee member who will be attending in person must be designated in advance as a Co-Chairperson;

   c) Remote.

   The modality is to be decided by the Oral Qualifying Exam or Dissertation Committee Chairperson or Co-Chairpersons, after consultations with the committee members and the student.

Normative Time to Degree

15 quarters

Lower-Division Courses

Mathematics advisory examinations are scheduled before each quarter. The UCR Mathematics Advisory Exam is a prerequisite for students who wish to enroll in math courses but have not received course equivalence in MATH 005A, MATH 007A, MATH 009A, MATH 009HA, or MATH 022.

MATH 003 College Mathematics Fundamentals and Problem Solving 3 Laboratory, 3 hours; screening, 3 hours; individual study, 3 hours. Prerequisite(s): a score on the Mathematics Advisory Examination, as determined by the Mathematics Department; restricted to freshman or an approved summer session enrollment; or consent of instructor. Prepares for success in a college-level mathematics course. Focuses on conceptual and problem solving. Emphasizes practicing symbolic reasoning, evaluating expressions, the meaning of quantities, variables, expressions, formulas, changes in quantities, inequalities, systems of equations, and functions (linear, exponential, logarithmic, quadratic, polynomial, rational, radical). Workload credit only; Graded Satisfactory (S) or No Credit (NC).

MATH 004 Introduction to College Mathematics For Business and the Social Sciences 5 Lecture, 3 hours; additional lecture, 2 hours. Prerequisite(s): MATH 003 or MATH 004L, may be taken concurrently; the Mathematics Department determines the study program pathway based upon the score on the Mathematics Advisory Examination; or a score of 2 on the AP Calculus AB Exam; not open to students in the Bourns College of Engineering or the College of Natural and Agricultural Sciences or to students majoring in Economics or Business Economics. Covers functions and their graphs including linear and polynomial functions, zeroes, and inverse functions as well as exponential and logarithmic functions and their inverses. Also includes counting including elementary probability. Involves applications to business and social sciences. Credit is awarded for one of the following MATH 004, MATH 005A, MATH 006A, or MATH 006B.

MATH 004L Introduction to College Mathematics For Business and the Social Sciences Workshop 1 Discussion, 1 hour. Prerequisite(s): MATH 004, may be taken concurrently; the Mathematics Department determines the study program pathway based upon the score on the Mathematics Advisory Examination; not open to students in the Bourns College of Engineering or the College of Natural and Agricultural Sciences or to students majoring in Economics or Business Economics; or consent of instructor. Just-in-time lessons and activities to enhance student foundations on functions and properties of functions from four perspectives (verbal, visual, numeric, and symbolic) to complement and support MATH 004. Graded Satisfactory (S) or No Credit (NC).

MATH 005A The Principles of Calculus 1 5 Lecture, 3 hours; additional lecture, 2 hours. Prerequisite(s): a score of 2 on the AP Calculus AB Exam or a sufficiently high score on the Mathematics Advisory Examination, as determined by the Mathematics Department. A study of inequalities, absolute value, functions, graphing, logarithms, trigonometry, roots of polynomials, counting, vectors, and other elementary concepts of mathematics. Some sections may be offered online. Credit is awarded for one of the following MATH 005A, MATH 004, MATH 006A, or MATH 006B.

MATH 005B The Principles of Calculus 2 5 Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): MATH 005A with a grade of C- or better. An introduction to application of finite approximation to study functions of one variable. Topics include sequences, series, differential calculus, and antiderivatives. Credit is awarded for one of the following MATH 005B, MATH 007A, MATH 009A, or MATH 09HA.

MATH 005C The Principles of Calculus 3 5 Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): MATH 005B with a grade of C- or better. Further topics on infinite series including test of convergence and Taylor's series. An introduction of integral calculus of one-variable with applications. Credit is awarded for one of the following MATH 005C, MATH 007B, MATH 009B, MATH 009C, MATH 09HB, or MATH 09HC.

MATH 006A Precalculus: An Introduction to Functions 1 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 003 or MATH 06LA, may be taken concurrently; the Mathematics Department determines the study program pathway based upon the score on the Mathematics Advisory Examination; or consent of instructor. Develops and refines quantitative reasoning, covariational reasoning, problem solving, and algebraic proficiency in preparation for calculus. Topics include functions, properties of functions, ways to create new functions, and modeling real-world situations with functions. Specific functions covered include linear, exponential, and logarithmic functions. Credit is awarded for one of the following MATH 006A, MATH 004, or MATH 005A.

MATH 006B Precalculus: An Introduction to Functions 2 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 006A with a grade of B- or better or MATH 006A with a grade of C- or better; MATH 06LB, may be taken concurrently; NOTE: MATH 006A with a grade of C-, C, or C+ requires concurrent enrollment in MATH 06LB; or MATH 006A with grades of B- or better may enroll in MATH 06LB as an option; or consent of instructor. Develops and refines quantitative and covariational reasoning skills and problem solving skills in preparation for calculus. Topics include functions, properties of functions, modeling real world situations with functions, limits, and continuity. Specific

functions covered include polynomial, rational, trigonometric, and inverse trigonometric functions. Credit is awarded for one of the following MATH 006B, MATH 004, or MATH 005A.

MATH 06LA Precalculus Study Group: An Introduction to Functions 1 1 Discussion, 1 hour. Prerequisite(s): MATH 006A, may be taken concurrently; the Mathematics Department determines the study program pathway based upon the score on the Mathematics Advisory Examination; or consent of instructor. Just-in-time lessons and activities to enhance student foundations on functions and properties of functions from four perspectives (verbal, visual, numeric, and symbolic) to complement and support MATH 006A. Graded Satisfactory (S) or No Credit (NC).

MATH 06LB Precalculus Study Group: An Introduction to Functions 2 1 Discussion, 1 hour. Prerequisite(s): MATH 006A with a grade of C- or better, MATH 06LB, may be taken concurrently; NOTE: MATH 006A with a grade of C-, C, or C+ requires concurrent enrollment in MATH 06LB; or MATH 006A with grades of B- or better may enroll in MATH 06LB as an option; or consent of instructor. Just-in-time lessons and activities to enhance student foundations on functions and properties of functions from four perspectives (verbal, visual, numeric, and symbolic) to complement MATH 006B. Graded Satisfactory (S) or No Credit (NC).

MATH 007A Calculus For Life Sciences 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005A or MATH 006B. Introduction to the differential calculus of functions of one variable for students majoring in Life Sciences. Credit is awarded for one of the following MATH 007A, MATH 005B, MATH 009A, or MATH 09HA.

MATH 007B Calculus For Life Sciences 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005B with a grade of C- or better or MATH 007A with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 09HA with a grade of C- or better. Introduction to the integral calculus of functions of one variable. For Life Sciences majors. Credit is awarded for one of the following MATH 007B, MATH 005C, MATH 009B, or MATH 09HB.

MATH 009A First-Year Calculus 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005A with a grade of C- or better or MATH 006B. Introduction to the differential calculus of functions of one variable. Credit is awarded for one of the following MATH 009A, MATH 005B, MATH 007A, or MATH 09HA.

MATH 009B First Year Calculus 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005B with a grade of C- or better or MATH 009A or MATH 09HA. Introduction to the integral calculus of functions of one variable. Credit is awarded for one of the following MATH 009B, MATH 005C, MATH 007B, or MATH 09HB.

MATH 009C First Year Calculus 4 Discussion, 1 hour; lecture, 3 hours. Prerequisite(s): MATH 009B with a grade of C- or better or MATH 09HB with a grade of C- or better or MATH 007B with a grade of C- or better. Further topics from integral calculus, improper integrals, infinite series, Taylor's series, and Taylor's theorem. Credit is awarded for one of the following MATH 009C, MATH 005C, or MATH 09HC.

MATH 09HA First-Year Honors Calculus 4 Discussion, 1 hour; lecture, 3 hours. Prerequisite(s): admission to University Honors. Honors course corresponding to MATH 009A. Honors course corresponding to MATH 009A for students with strong mathematical backgrounds. Introduces the differential calculus of functions of one variable. Emphasis is on theory and rigor Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following MATH 09HA, MATH 005B, MATH 007A, or MATH 009A.

MATH 09HB First-Year Honors Calculus 4 Discussion, 1 hour; lecture, 3 hours. Prerequisite(s): MATH 09HA with a grade of B or better; admission to University Honors. Honors course corresponding to MATH 009B. Honors course corresponding to MATH 009B for students with strong mathematical backgrounds. Introduces the integral calculus of functions of one variable. Emphasis is on theory and rigor. Credit is awarded for one of the following MATH 09HB, MATH 005C, MATH 007B, or MATH 009B.

MATH 09HC First-Year Honors Calculus 4 Discussion, 1 hour; lecture, 3 hours. Prerequisite(s): MATH 09HB with a grade of B or better or MATH 009B with a grade of B or better; admission to University Honors. Honors course corresponding to MATH 009C. Further topics from integral calculus, improper integrals, infinite series, Taylor's series, and Taylor's theorem. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following MATH 09HC, MATH 005C, or MATH 009C.

MATH 010A Calculus of Several Variables 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005C with a grade of C- or better or MATH 007B with a grade of C- or better or MATH 009B with a grade of C- or better or MATH 09HB with a grade of C- or better; or equivalent. Topics include Euclidean geometry, matrices and linear functions, determinants, partial derivatives, directional derivatives, Jacobians, gradients, chain rule, and Taylor's theorem for several variables.

MATH 010B Calculus of Several Variables 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of "C-" or better or equivalent. Covers vectors; differential calculus, including implicit differentiation and extreme values; multiple integration; line integrals; vector field theory; and theorems of Gauss, Green, and Stokes.

MATH 011 Introduction to Discrete Structures 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010A or MATH 005C or MATH 007B or MATH 009B or MATH 09HB. Introduction to basic concepts of discrete mathematics emphasizing applications to computer science. Topics include propositional and predicate calculi, elementary set theory, functions, relations, proof techniques, elements of number theory, enumeration, and discrete probability. Cross-listed with CS 011.

MATH 022 Calculus For Business 5 Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): MATH 004 with a grade of C- or better or MATH 006B with a grade of C- or better or MATH 005A; or a sufficiently high score on the placement examination, as determined by the Mathematics Department. Explores relations and functions (e.g., linear, polynomial, logarithmic, and exponential). Addresses differential calculus of functions of one and two variables as well as integration (indefinite and definite) with applications to business and economic problems. Credit is not awarded for MATH 022 if a grade of "C-" or better has already been awarded for MATH 007A, MATH 009A, MATH 09HA, or MATH 005B.

MATH 031 Applied Linear Algebra 5 Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): CS 010A with a grade of C- or better or MATH 005C with a grade of C- or better or MATH 007B with a grade of C- or better or MATH 009B with a grade of C- or better or MATH 09HB with a grade of C- or better. A study of matrices and systems of linear equations, determinants, Gaussian elimination, vector spaces, linear independence and linear transformation, orthogonality, eigenvalues, and eigenvectors. Also examines selected topics and applications. Credit is awarded for one of the following MATH 031 or EE 020B.

MATH 045 Introduction to Ordinary Differential Equations For Physical Sciences and Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005C with a grade of C- or better or MATH 007B with a grade of C- or better or MATH 009B with a grade of C- or better or MATH 09HB with a grade of C- or better; or equivalent; or consent of instructor. Introduction to ordinary differential equations; complex numbers; trigonometric, compact and exponential Fourier Series; frequency spectrum; and Laplace transform, Fourier transform, and their application to the solution of integro-differential equations as they appear in the physical sciences and engineering. Cross-listed with EE 020A. Credit is awarded for one of the following MATH 045, EE 020A, or MATH 046.

MATH 046 Introduction to Ordinary Differential Equations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005C with a grade of C- or better or MATH 007B with a grade of C- or better or MATH 009B with a grade of C- or better or MATH 09HB with a grade of C- or better. Introduction to first-order equations, linear second-order equations, and Laplace transforms, with applications to the physical and biological sciences. Credit is awarded for one of the following MATH 046, EE 020A, or MATH 045.

Upper-Division Courses

Courses numbered MATH 100–109 do not meet upper-division mathematics requirements.

MATH 110 An Introduction to Mathematical Proofs 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009B with a grade of C- or better or MATH 09HB with a grade of C- or better or MATH 007B with a grade of C- or better or MATH 005C with a grade of C- or better; or consent of instructor. An introduction to communicating mathematics through proofs. Topics include basic logic, set theory, functions, and various proof techniques such as induction, direct, contrapositive, contradiction, and cases. May also include equivalence relations, countability, number theory, structure of the real numbers, sequences, and continuity.

MATH 120 Optimization 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of "C-" or better; MATH 031 with a grade of "C-" or better. Introduction to classical optimization including unconstrained and constrained problems in several variables, Addresses Jacobian and Lagrangian methods and the Kuhn-Tucker conditions. Covers the basic concepts of linear programming including the simplex method and duality with applications to other subjects.

MATH 121 Game Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of C- or better, MATH 110 with a grade of C- or better. Examines games in extensive, normal, and characteristic form as models of conflict and/or cooperation. Covers two-person zero-sum games, minimax theorem, and relation to linear programming. Includes non-zero-sum games, Nash equilibrium theorem, bargaining, the core, and the Shapley value. Addresses economic market games.

MATH 126 Combinatorics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 011 with a grade of C- or better or CS 011 with a grade of C- or better or MATH 110 with a grade of C- or better. A study of elements of combinatorics theory. Topics include chromatic polynomials, enumerating partitions of sets and integers, asymptotic enumeration, Polya theory, and Ramsey theory.

MATH 131 Linear Algebra I 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of C- or better, may be taken concurrently; MATH 031 with a grade of C- or better; MATH 110 with a grade of C- or better, may be taken concurrently. An introduction to vector spaces, matrices, and linear transformations.

MATH 132 Linear Algebra 2 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 131 with a grade of "C-" or better or equivalent. Further study of topics in linear algebra including eigenvalues. Exploration of Hermitian and unitary matrices, positive definite matrices, and canonical forms.

MATH 133 Geometry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 031 with a grade of C- or better, MATH 110 with a grade of C- or better. Analyzes elementary theory of affine and projective planes, the line at infinity, finite geometries, Euclidean and non-Euclidean geometries, groups of transformations, and other algebraic structures related to geometry.

MATH 135A Introduction to Numerical Analysis 1 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 010A with a grade of C- or better, may be taken concurrently; MATH 031 with a grade of C- or better, may be taken concurrently; or equivalent; or consent of instructor. Introduces basic numerical techniques for computing solutions of problems in science and engineering as well as computational implementation of such techniques using MATLAB and Python. Topics include floating point computation, error analysis, numerical methods for solutions of linear and nonlinear scalar and systems of equations, and numerical interpolation.

MATH 135B Introduction to Numerical Analysis 2 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 135A with a grade of C- or better; or equivalent; or consent of instructor. Introduces basic numerical techniques for computing solutions of problems in science and engineering as well as computational implementation of such techniques using MATLAB and Python. Topics include numerical integration, Runge-Kutta methods for initial value problems, matrix factorizations, eigenvalues, and eigenvectors.

MATH 135C Introduction to Numerical Analysis 3 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 135B with a grade of C- or better; or equivalent; or consent of instructor. A continuation of Math 135B. Topics include least square method, Fourier series, numerical methods for PDEs, and numerical optimization.

MATH 136 Introduction to the Theory of Numbers 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 031 with a grade of C- or better, MATH 110 with a grade of C- or better. Covers prime and composite integers, number theoretic functions, diophantine equations, congruences, quadratic reciprocity, and additive arithmetic.

MATH 138A Introduction to Differential Geometry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A; MATH 031 with a grade of C- or better; MATH 110 with a grade of C- or better. Examines elementary theory of curves and surfaces. Includes first and second fundamental forms.

MATH 138B Introduction to Differential Geometry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of "C-" or better, MATH 138A with a grade of "C-" or better. Covers Gaussian curvature, geodesics, and the Gauss-Bonnet Theorem.

MATH 140 Polynomials and Number Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 011 with a grade of C- or better or CS 011 with a grade of C- or better or MATH 110 with a grade of C- or better; MATH 031 with a grade of C- or better. Topics include number systems, elementary number theory, rings, fields, polynomials, congruencies, and applications of finite fields.

MATH 144 Introduction to Set Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of C- or better; MATH 110 with a grade of C- or better. Covers algebra of subsets of a set. Addresses algebra of relations and functions. Explores cardinal and ordinal numbers and their arithmetic operations. Includes the well-ordering theorem, transfinite induction, and Zorn's lemma.

MATH 145A Introduction to Topology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 110 with a grade of C- or better. Addresses elementary topology in metric spaces.

MATH 145B Introduction to Topology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 145A with a grade of "C-" or better. Explores geometric topology, algebra associated with finite complexes, and applications.

MATH 146A Ordinary and Partial Differential Equations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005C with a grade of C- or better or MATH 009C with a grade of C- or better or MATH 09HC with a grade of C- or better; MATH 010A with a grade of C- or better; MATH 031 with a grade of C- or better, may be taken concurrently; MATH 046 with a grade of C- or better; MATH 110 with a grade of C- or better, may be taken concurrently. Focuses on the theory of linear differential equations and transform methods.

MATH 146B Ordinary and Partial Differential Equations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 146A with a grade of "C-" or better. Further study of the theory of linear differential equations and problems in valuing ordinary differential equations.

MATH 146C Ordinary and Partial Differential Equations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of "C-" or better, MATH 146B with a grade of "C-" or better. Explores boundary value problems for partial differential equations, orthogonal expansions, and separation of variables.

MATH 147 Introduction to Fourier Analysis and its Applications 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005C with a grade of C- or better or MATH 009C with a grade of C- or better or MATH 09HC with a grade of C- or better; MATH 010B with a grade of C- or better; MATH 031 with a grade of C- or better, may be taken concurrently; MATH 046 with a grade of C- or better or MATH 146A with a grade of C- or better; MATH 110 with a grade of C- or better. Covers Fourier series expansions of periodic functions, properties, and convergence; the Dirichlet kernel; Fourier integrals and the Fourier transform in one and several variables; the Plancherel theorem; and Fourier inversion. Includes applications of Fourier analysis (e.g., to spectral theory, numerical analysis, ordinary and partial differential equations, and wavelet transform).

MATH 148 Introduction to Chaotic and Complex Dynamical Systems 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of "C-" or better; MATH 031 with a grade of "C-" or better; MATH 046 or MATH 146A with a grade of "C-" or better; or consent of instructor. Explores examples of dynamical systems, quadratic maps, maps of the circle, and higher-dimensional examples. Includes symbolic dynamics, Sarkovskii's theorem, hyperbolicity, and structural stability. Introduces chaotic dynamical systems and the period doubling route to chaos. Also introduces basic notions from complex dynamics. Includes the Julia set and the Mandelbrot set.

MATH 149A Probability and Mathematical Statistics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of C- or better; MATH 010B with a grade of C- or better; MATH 046 with a grade of C- or better, may be taken concurrently; MATH 110 with a grade of C- or better, may be taken concurrently. An introduction to the mathematical theory of probability and discrete and continuous distributions.

MATH 149B Probability and Mathematical Statistics 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of "C-" or better, MATH 010B with a grade of "C-" or better, MATH 046 with a grade of "C-" or better, MATH 149A with a grade of "C-" or better. A continuation of MATH 149A. Topics include sampling and limit distributions.

MATH 150 Intermediate Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005C with a grade of C- or better or MATH 009C with a grade of C- or better or MATH 09HC with a grade of C- or better; MATH 010B with a grade of C- or better; MATH 110 with a grade of C- or better, may be taken concurrently; or equivalent; or consent of instructor. A study of the concepts and theory of single-variable calculus. Covers the basics of real numbers, sequences, limits, continuity, and differentiation. Credit is awarded for one of the following MATH 150 or MATH 151A.

MATH 151A Foundations of Real Analysis 1 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005C with a grade of C- or better or MATH 009C with a grade of C- or better or MATH 09HC with a grade of C- or better; MATH 010B with a grade of C- or better; MATH 110 with a grade of C- or better; or equivalent; or consent of instructor. Provides a rigorous development of mathematical analysis includes the formal theory of the real numbers, convergent sequences, monotone sequences, subsequences, convergent tests, limit superior, limit inferior, Bolzano-Weierstrass theorem, Cauchy sequences, limit of functions, continuous functions, extreme value theorems, intermediate value theorems, uniform continuity, and continuity of monotone functions. Credit is awarded for one of the following MATH 151A or MATH 150.

MATH 151B Foundations of Real Analysis 2 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 151A with a grade of C- or better; or equivalent; or consent of instructor. Provides a rigorous development of mathematical analysis. Includes properties of the derivative; mean value theorem, intermediate value theorem, Taylor's theorem, inverse function theorem, fundamental theorem of calculus; Riemann integrable functions, sequences and series of functions, pointwise and uniform convergence of functions, and the continuity, integral, and derivative of the limit.

MATH 151C Foundations of Real Analysis 3 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 131 with a grade of C- or better; MATH 151B with a grade of C- or better; or equivalent; or consent of instructor. Provides a rigorous development of mathematical analysis. Includes metric spaces, open and closed sets, connected sets, closure and boundary, convergent sequences, Cauchy sequences, completeness, compactness, Heine-Borel theorem, continuity, uniform continuity, limits, the derivative, gradients, curves, partial derivatives, the Jacobian, continuity and the derivative, and inverse and implicit function theorems.

MATH 153 History of Mathematics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005C with a grade of C- or better or MATH 009C with a grade of C- or better or MATH 09HC with a grade of C- or better; MATH 110 with a grade of C- or better; or consent of instructor. A survey from a historical point of view of various developments in mathematics. Emphasizes the nineteenth and early twentieth centuries.

MATH 161 Mathematical Foundations of Machine Learning 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A with a grade of C- or better, MATH 031 with a grade of C- or better; or equivalent; or consent of instructor. Introduction to mathematical concepts in machine learning methods emphasizing the theoretical tools needed for developing new machine learning algorithms. Topics include linear algebra and vector calculus in application to supervised learning, regression, classification, unsupervised learning, clustering, dimensionality reduction and optimization, and probability theory used in machine learning algorithms.

MATH 162 Mathematical Models and Computational Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 031 with a grade of C- or better, MATH 135A with a grade of C- or better; or equivalent; or consent of instructor. An introduction to mathematical and computational modeling using high-level computer programming languages such as C/C++. Includes implementation of parallel algorithms for solving linear systems, systems of differential equations, and running stochastic imulations on high performance CPU and GPU computer clusters.

MATH 163 Applied Dynamical Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 045 with a grade of C- or better or MATH 046 with a grade of C- or better; MATH 031 with a grade of C- or better; MATH 135A with a grade of C- or better; or equivalent; or consent of instructor. Introduction to dynamical systems with applications to problems in Physics, Biology, Chemistry, and Engineering. Topics include phase plane analysis, stability of dynamical systems, and numerical methods for dynamical systems.

MATH 165A Introduction to Complex Variables 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of C- or better; MATH 110 with a grade of C- or better. An introduction to the theory of analytic functions of a complex variable. Includes mappings by elementary functions and complex integrals as well as Cauchy's theorem, power series, and Laurent series.

MATH 165B Introduction to Complex Variables 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of "C-" or better, MATH 165A with a grade of "C-" or better. Topics include the theory of residues, conformal mapping, and applications to physical problems.

MATH 168 Introduction to Mathematical Modeling 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 146A. A detailed study of how mathematical methods are applied to specific problems in the sciences and engineering fields. Utilizes examples taken from the theories of mechanical vibrations, population dynamics, and flow phenomena.

MATH 171 Introduction to Modern Algebra 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 110 with a grade of C- or better; MATH 131 with a grade of C- or better. An introduction to the fundamental concepts of modern algebra. Covers groups, subgroups, quotient groups, homomorphisms, symmetry groups, fundamental properties of rings, integral domains, ideals, and quotient rings.

MATH 172 Modern Algebra 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MATH 171 with a grade of "C-" or better. Covers fundamental concepts of modern algebra. Includes groups, fields, polynomials, geometric constructions, algebraic coding, and boolean algebras.

MATH 190 Special Studies 1 to 5 Tutorial, 3 to 15 hours. To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable.

MATH 194 Independent Reading 1 to 2 Tutorial 3 to 6 hours. Independent reading in materials not covered in course work. Normally taken in the senior year. Total credit for MATH 194 may not exceed 4 units.

MATH 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): upper-division standing; consent of instructor. Involves a research project on a problem in, or related to, mathematics conducted under the supervision of a Mathematics faculty member. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 8 units.

MATH 198I Internship in Mathematics 1 to 4 variable hours. Prerequisite(s): upper-division standing, with at least 12 units of upper-division credits toward the major. An academic internship to provide the student

with career experience as a mathematician in a governmental, industrial, or research unit under the joint supervision of an off-campus sponsor and a faculty member in Mathematics. Each individual program must have the prior approval of both supervisors and the department chair. A final written report is required. Graded Satisfactory (S) or No Credit (NC). May be repeated for a total of 8 units.

Graduate Courses

MATH 201A Algebra 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 171, MATH 172, or equivalents. Topics include basic theory of groups and rings, the Sylow theorems, solvable groups, and the Jordan-Holder theorem.

MATH 201B Algebra 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 201A. Topics include rings, the functors hom and tensor, modules over a principle ideal domain, and applications to matrices.

MATH 201C Algebra 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 201B Topics include algebraic and transcendental extensions of fields and the Galois theory, and the tensor and exterior algebras.

MATH 205A Topology 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 145B or equivalent; graduate standing. An introduction to pointset topology.

MATH 205B Topology 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 205A or equivalent; graduate standing. Covers homotopy theory and homology theory.

MATH 205C Topology 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 205A, MATH 205B, or equivalents; graduate standing. Covers differential topology.

MATH 206A Theory of Probability 4 Lecture, 3 hours; individual study, 2 hours, written work, 4 hours. Prerequisite(s): MATH 149A or equivalent; or consent of instructor. Introduces probability theory from the measure-theoretic perspective. Topics include construction of independent random variables, laws of large numbers, central limit theorems, and concentration of measure of sums of independent variables.

MATH 206B Numerical Analysis 4 Lecture, 3 hours; individual study, 2 hours, written work, 4 hours. Prerequisite(s): MATH 135A or equivalent; or consent of instructor. An introduction to numerical analysis. Topics include numerical solution of nonlinear differential equations, numerical linear algebra, interpolation ad extrapolation, numerical differentiation and integration, initial value problems and boundary value problems of ordinary differential equations and approximation theory.

MATH 206C Method of Applied Mathematics 4 Lecture, 3 hours; individual study, 2 hours; written work, 4 hours. Prerequisite(s): MATH 146A; MATH 150 or MATH 151A; graduate standing; or consent of instructor. Introduction of basic applied to mathematics methods including variational methods with examples from mechanics, ordinary differential equations, bifurcation theory and perturbation methods.

MATH 207A Ordinary Differential Equations 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 146B, MATH 151B; graduate standing; or consent of instructor. Covers existence, uniqueness, and stability of solutions to ordinary differential equations. Addresses important examples, dynamical flows associated to solutions, stable and unstable manifold phenomena, and boundary value problems. Also includes Lyapunov functions, poincare Map, and Sturm-Liouville Boundary Value Problems.

MATH 207B Partial Differential Equations 1 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 010B, MATH 151B; graduate standing; or consent of instructor. Discusses various methods used in the study of partial differential equations (PDEs). Addresses energy estimates, characteristics, similarity solutions, numerics, and fundamental solutions. Focuses on concrete examples of PDEs including conservation laws, the transport equation, the heat equation, the porous media equation, the Navier-Stokes equation, the Laplace equation, and the wave equation.

MATH 207C Partial Differential Equations 2 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 207B; graduate standing; or consent of instructor. A continuation of MATH 207B. Discusses various problems and methods in the study of partial differential equations (PDEs). Topics include Green's functions, boundary value problems, regularity of solutions, eigenvalue problems, energy methods, and variational methods.

MATH 209A Real Analysis 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 151C; graduate standing. Topics include Lebesgue measure, integration, and differentiation.

MATH 209B Real Analysis 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 209A; graduate standing. Topics include representation theorems, Hilbert space, Lebesgue spaces, and Banach spaces.

MATH 209C Real Analysis 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 209B; graduate standing. Topics include complex measures, general measure spaces, integration on product spaces, and Lebesgue spaces.

MATH 210A Complex Analysis 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 151C, MATH 165A; graduate standing. Studies include complex analytic functions, Cauchy's theorem, Cauchy's integral formula and the Laurent series, and the residue theorem.

MATH 210B Complex Analysis 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 210A. Studies include entire and meromorphic functions, normal families and the Riemann mapping theorem, and harmonic functions and the Dirichlet problem.

MATH 210C Complex Analysis (riemann Surfaces) 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MATH 210B; graduate standing, or consent of instructor. Studies Riemann surfaces and their origins, analytic and meromorphic functions on Riemann surfaces, the topology of surfaces, and calculus on surfaces. Also covers the Laplace operator and Hodge theory on Riemann surfaces, the Riemann-Roch formula, the uniformization theorem, and other selected topics.

MATH 211A Ordinary Differential Equations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 146B, MATH 151C; graduate standing. Covers the existence and uniqueness of solutions; linear differential equations; singularities of the first and second kind; self-adjoint eigenvalue problems on a finite interval; and singular self-adjoint boundary-value problems for second-order equations.

MATH 211B Ordinary Differential Equations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 211A. Topics include the method of averaging and numerical integration, autonomous systems, the method of Liapounov, and stability for linear systems.

MATH 212 Partial Differential Equations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 151C, MATH 165A; graduate standing. Classical theory of initial and boundary value problems for hyperbolic, parabolic and elliptic partial differential equations.

MATH 213A Numerical Methods For Partial Differential Equations 1 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): MATH 206B, MATH 207B; graduate standing; or consent of instructor. Introduces standard numerical methods to approximate solutions to parabolic equations; elliptic equations including finite difference; finite element; multi-grid method, spectral method; method of lines; exponential time differencing method; and integration factor method. Investigates stability, accuracy, and convergence of numerical methods. Includes implementation of numerical methods on specific problems.

MATH 213B Numerical Methods For Partial Differential Equations 2 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): MATH 206B, MATH 207B; graduate standing; or consent of instructor. Introduces standard numerical methods to approximate solutions to hyperbolic conservation laws such as upwind, Lax Friedrichs, Lax-Wendroff, construction of limiters, ENO, and WENO. Investigates entropy conditions, construction of numerical fluxes, monotonicity, and convergence and accuracy of numerical methods. Implements numerical methods on classic examples such as the Euler system.

MATH 213C Numerical Methods For Stochastic Partial Differential Equations 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): MATH 206A, MATH 207B; graduate standing; or consent of instructor. Introduces stochastic

optimization and standard numerical methods to approximate solutions to stochastic ordinary differential equations and stochastic partial differential equations. Investigates consistency, stability, and convergence of numerical methods. Also investigates convergence, rate of convergence, and its connection with stochastic differential equations. Includes applications and implementation of stochastic methods.

MATH 216 Combinatorial Theory 4 Discussion, 1 hour; lecture, 3 hours. Prerequisite(s): CS 111; graduate standing. Addresses the solving of combinatorial problems by studying their morphisms (transformations preserving the problem). Covers optimum path problems and their variants. Develops general techniques and the ability to work through the solutions of challenging special cases. Focuses on utilizing symmetry to systematically reduce a problem.

MATH 221 Several Complex Variables 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 151A, MATH 151B, MATH 165A, MATH 165B; graduate standing. Hartog's theorems, domains of holomorphy, pseudoconvexity, Levi's problem, coherent analytic sheaves, Cartan's theorems A and B.

MATH 222 Algebraic Groups 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): MATH 201B; MATH 205A; graduate standing. Introduction to linear algebraic groups, structure, and representation.

MATH 223 Algebraic Number Theory 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 201A; graduate standing. Topics include algebraic number theory, principal ideal domains, integral independence, algebraic number fields, classical ideal theory in Dedekind domains, classes of ideals, valuations, and p-adic numbers.

MATH 224 Introduction to Homological Algebra 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 201C; graduate standing; or consent of instructor. Theory of derived functors and its application to rings and associative algebras.

MATH 225 Commutative Algebra 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 201C; graduate standing. Covers basic theory of commutative rings, primary decomposition, integral dependence and valuation rings, and the intersection theorem of Krull.

MATH 226 Algebraic Analysis 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 201B, MATH 205A; graduate standing. Introduction to the theory of modules over rings of differential operators. Topics include holonomic D-modules, functorial properties, and applications.

MATH 227A Lie Algebras 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 201A, MATH 201B; graduate standing. Studies include basic definitions, solvable and nilpotent Lie algebras, and structure and classification of semisimple Lie algebras.

MATH 227B Lie Algebras 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 227A; graduate standing . Studies include enveloping algebras and representation theory, representations of semisimple Lie algebras, generalization to Kac-Moody Lie algebras, and modular Lie algebras.

MATH 228 Functional Analysis 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MATH 209A, MATH 209B, MATH 209C; graduate standing. Topological linear spaces; function spaces; linear operators; spectral theory; operational calculus; and further selected topics.

MATH 230 Deformation Theory 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 201B, MATH 232B; graduate standing. Introduction to deformation quantization. Topics include Hochschild complexes of associative algebras, differential graded Lie algebras, quasi-isomorphisms, Kontsevich's formality theorem, and star-products.

MATH 232A Geometry 1 (introduction to Manifolds) 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 131 and MATH 151C; graduate standing. Basic notions and examples; vector fields and flows; tensors and vector bundles; differential forms, integration and deRham's theorem.

MATH 232B Geometry 2 (introduction to Differential) 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 232A; graduate standing. Local and global theory of curves. Surfaces in R3: the Gauss map, fundamental forms, curvature. Riemannian geometry: the Levi-Civita connection, curvature, geodesics, exponential map, completeness, Gauss-Bonnet theorem for surfaces.

MATH 241 Mathematical Physics: Classical Mechanics 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 205A, MATH 205B, MATH 205C; or PHYS 205; graduate standing; or consent of instructor. Hamilton's principle of least action. Variational methods and Lagrange's equations. Hamilton's equations. Introduction to symplectic geometry and its applications to classical mechanics. Poisson brackets. Conserved quantities and Noether's theorem. Examples of Hamiltonian and dissipative dynamical systems. Introduction to classical chaos.

MATH 242 Mathematical Physics: Quantum Mechanics 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 209A, MATH 209B, MATH 209C, MATH 228; graduate standing; or consent of instructor. Foundations of quantum theory together with the relevant mathematics. Probabilistic interpretation of quantum mechanics, self-adjoint operators and physical observables, noncommutativity and the uncertainty principle. Spectral theory for (unbounded) self-adjoint operators. Stone's theorem and other topics.

MATH 243A Algebraic Geometry 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 201A, MATH 201B; graduate standing. Topics include algebraic varieties in affine and projective space and their basic attributes such as dimension, degree, tangent space, and singularities; and products, mappings, and correspondences.

MATH 243B Algebraic Geometry 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 243A; graduate standing. Topics include further study of varieties, sheaves, and cohomology and detailed study of curves and special topics.

MATH 245 Analytic Number Theory 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 165B, MATH 209A; graduate standing; or consent of instructor. Explores the key structures of analytic number theory. Addresses the theory of the Riemann zeta function: functional equation, analytic continuation, and zero-free regions. Illustrates application to the prime number theorem. Considers the Mellin transform and other Dirichlet series, including Dirichlet L-functions.

MATH 246A Algebraic Topology 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 205A; MATH 205B or equivalent; graduate standing. Topics include simplicial and cell complexes, polyhedra, manifolds, homology and cohomology theory, and homotopy theory.

MATH 246B Algebraic Topology 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 246A; graduate standing. Covers topics such as topological indices, Lefschetz fixed point theory, Poincar duality, vector bundles and characteristic classes, and transformation groups.

MATH 247 Theory of Distributions and Applications 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 146A, MATH 209C; graduate standing; or consent of instructor. Explores approximation of differentiable functions. Addresses theory of distributions, including basic properties, differentiation, and key operations. Covers applications to multivariable calculus and classical equations of mathematical physics. Examines particular spaces of distributions; convolution and Fourier transform; fractional differentiation; Fourier integral operators; and pseudo differential operators.

MATH 248 Harmonic Analysis and Applications 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 146C, MATH 165B, MATH 209C; graduate standin; or consent of instructor. A study of Fourier series. Includes summability methods, kernels, Fourier transform, unitarity, applications to the uncertainty principle, and distributional Fourier transform. Introduces Hardy spaces, singular integral operators, and wavelet theory and its applications. Other topics include interpolation of linear operators and spectral analysis and applications.

MATH 249 Introduction to Dynamical Systems 4 Lecture, 3 hours, outside research, 3 hours. Prerequisite(s): MATH 146B; MATH 151C; MATH 205C or MATH 232A; graduate standing; or consent of instructor. Explores diffeomorphisms and flows, Poincare maps, and Hamiltonian flows. Includes hyperbolicity,

homoclinic points, center manifold theorem, structural stability, and Hopf bifurcations. Explores the Poincare-Birkhoff theorem, basin of attraction and strange attractors, and Lyapunov exponents and entropy. Introduces chaotic dynamical systems, KAM theory, and complex dynamics.

MATH 250A Mathematical and Computational Modeling With Applications A: Stability of Applied Dynamical Systems 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): MATH 206C; graduate standing; or consent of instructor. Introduction to stability analysis of continuous dynamical systems with applications in physics, biology, and engineering. Topics include phase plane analysis; stability of equilibria; asymptotic stability and Lyapunov stability; linear stability analysis of infinite-dimensional dynamical systems; limit cycles; and global attractors and their fractal dimension.

MATH 250B Mathematical and Computational Modeling With Applications B: Multi-Scale Analysis With Applications 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): MATH 206C; graduate standing; or consent of instructor. Introduction to perturbation methods in multi-scale systems with applications in physics, biology, and engineering. Topics include matched asymptotics analysis, homogenization, sharp interface limit, viscosity solutions, and mean field approaches to many particle systems.

MATH 250C Mathematical and Computational Modeling With Applications C: Modeling With Differential Equations 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): MATH 168, MATH 206C; graduate standing; or consent of instructor. Introduction to mathematical modeling and model calibration. Focuses on modeling with ordinary and partial differential applications in solid and fluid mechanics as well as biology, chemistry, and engineering. Topics include reaction kinetics equations; population models; parameter estimation; sensitivity analysis; modeling elastic, viscoelastic, plastic materials, and fluids; and cellular automata.

MATH 259 Topics in Mathematics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Explores various intermediate graduate topics in mathematics. Course is repeatable as content or topic changes. Course is repeatable as content or topic changes.

MATH 260 Seminar On Special Topics of Mathematics 1 to 4 Seminar, 1 to 4. Prerequisite(s): graduate standing; and consent of department. Seminar on special topics of mathematics in preparation for individual research. Course is repeatable.

MATH 261 Advanced Topics in Mathematics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Explores various research level topics in mathematics. Course is repeatable as content or topic changes.

MATH 289 Colloquium in Mathematics 1 Colloquium, 1 hour. Prerequisite(s): graduate standing. Specialized discussions by staff, students and visiting scientists on current research topics in Mathematics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MATH 290 Directed Studies 1 to 6 Tutorial, 3 to 18 hours. Prerequisite(s): graduate standing; and consent of instructor. Research and special studies in mathematics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MATH 291 Individual Study in Coordinated Areas 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing in Mathematics or consent of instructor. Designed to advise and assist candidates with exam preparation Graded Satisfactory (S) or No Credit (NC). Course is repeatable prior to successful completion of the qualifying examination for M.A. and M.S. students to a maximum of 6 units and for Ph.D. students to a maximum of 12 units.

MATH 297 Directed Research 1 to 6 Research, 3 to 18, hours. Prerequisite(s): graduate standing; consent of department. Directed research in mathematics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable more than once per quarter if studying with two or more faculty members.

MATH 299 Research For Thesis Or Dissertation 1 to 12 Thesis, 3-36 hours. Prerequisite(s): consent of department. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

MATH 302 Apprentice Teaching 2 to 4 Lecture, 0 to 1 hour; seminar, 2 to 4 hours; consultation, 1 to 2, Prerequisite(s): graduate standing. Supervised training for teaching in lower- and upper-division Mathematics courses. Modern trends in mathematical pedagogy at the college level. Covers instructional methods and classroom/section activities most suitable for teaching Mathematics. Designed for new graduate students in the Mathematics Department. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MATH 401 Professional Development in Mathematics 2 Lecture, 1 hour; consultation, 1 hour. Prerequisite(s): graduate standing in Mathematics. Includes professional and research ethics, scientific writing and publications, oral presentation skills, career options in academia, and nonacademic careers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Mechanical Engineering

Subject abbreviation: ME
The Marlan and Rosemary Bourns College of Engineering

Guanshui Xu, Ph.D. Chair
Department Office, A361 Bourns Hall
(951) 827-2497; **https://www.me.ucr.edu/**

Professors

Reza Abbaschian, Ph.D. *Distinguished Professor*
S. Jack Hu, Ph.D., Chancellor, *Distinguished Professor*
Heejung Jung, Ph.D.
Chris Lynch, Ph.D., Dean, Bourns College of Engineering
Lorenzo Mangolini, Ph.D.
Cengiz Ozkan, Ph.D.
Marko Princevac, Ph.D., Vice Provost
Thomas Stahovich, Ph.D.
Kambiz Vafai, Ph.D., *Distinguished Professor*
Akula Venkatram, Ph.D., *Distinguished Professor*
Guanshui Xu, Ph.D., *Distinguished Professor*

Professor Emeritus

Guillermo Aguilar, Ph.D.

Associate Professors

Sinisa Coh, Ph.D.
P. Alex Greaney, Ph.D.
Chen Li, Ph.D.
Venkataramabhargav (Bhargav) Rallabandi, Ph.D.
Masaru P. Rao, Ph.D.
Hideaki Tsutsui, Ph.D.
Richard Wilson, Ph.D.

Assistant Professors

Mingyu Cai, Ph.D.
Mona Eskandari, Ph.D.
Kavan Hazeli, Ph.D.
Eunjeong Hyeon Ph.D.
Kaveh Laksari, Ph.D.
Yaofa Li, Ph.D.
Ruoqian Lin, Ph.D.
Tamar Mentzel, Ph.D.
Ahmad Mohammadpanah Foroutaghe, Ph.D.
Erfan Nozari, Ph.D.
Jonathan Realmuto, Ph.D.
Jun Sheng, Ph.D.
Yuanhang Zhu, Ph.D.

Associate Professor in Teaching

Sundararajan Venkatadriagram, Ph.D.
Luat Vuong Ph.D.

Assistant Professor in Teaching

Dmyto Zagrebelnyy, Ph.D.
**

Adjunct Professors

Guillermo Aguilar, Ph.D.
Juan Hernandez-Cordero, Ph.D.
Alfredo Martinez-Morales, Ph.D.

Cooperating Faculty

Bahman Anvari, Ph.D. (Bioengineering)
Matthew Barth, Ph.D. (Electrical and Computer Engineering)
Georgios Karavalakis, Ph.D. (Chemical Environmental Engineering)
Konstantinos Karydis, Ph.D. (Electrical and Computer Engineering)
Chung-Hao Lee Ph.D. (Bioengineering)
Maziar Raissi Ph.D. (Mathematics)
Michael Zachariah, Ph.D. *Distinguished Professor* (Chemical and Environmental Engineering)

Major

The design and production of machines requires a broad-based education. The Mechanical Engineering degree program has been structured to provide the necessary background in chemistry, physics, and advanced math to achieve success in the advanced engineering subjects. In addition, students are taught the basics of Mechanical Engineering while learning about the latest developments and experimental techniques.

The Mechanical Engineering Program Educational Objectives are to prepare graduates to make a positive impact on society by being successful in:

- careers as mechanical engineers and as engineering leaders
- graduate studies and research
- professional careers besides mechanical engineering
- advocating for the engineering profession and inspiring others to develop a passion for engineering profession.

The Bachelor of Science in Mechanical Engineering (ME) Program is accredited by the Engineering Accreditation Commission (EAC) of ABET, **abet.org**, under the commission's General Criteria and Program Criteria for Mechanical and similarly named Engineering Programs. For additional details, see **https://www.me.ucr.edu/abet/**.

All undergraduates in the College of Engineering must see an advisor at least annually. Visit **student.engr.ucr.edu** for details.

Change of Major Criteria

All students who request a change of major to Mechanical Engineering must meet the following requirements:

- Be in good academic standing
- Have no less than a C- in any Math, Science and Engineering coursework
- Have a minimum 2.0 GPA in all Math, Science and Engineering required coursework
- Be able to complete major within maximum allowable units
- Complete all the courses listed below, based on the total number of units earned, prior to submitting the major change request
- UCR transfer students interested in changing to a BCOE major must have been admissible to the major at point of entry, or must satisfy transfer admission and change of major requirements before earning 120 units
- If changing in the 90-119 units category student must have the ability to complete major within 5 years of entry as a Freshmen or 3 years after entry as a Transfer student
- Students who have earned 120 or more units are not eligible for a change of major in BCOE. NOTE: AP/IB units are excluded from maximum unit calculation

Completed 0 to less than 45 units Completion of ENGL 001A with C or better and completion of the following with at least 2.500 GPA:

- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- PHYS 040A

Completed 45 to less than 90 units
Completion of ENGL 001A with C or better and completion of the following with at least 2.500 GPA:

- ME 002
- ME 018A
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A

Completed 90 to less than 120 units
Completion of ENGL 001A and ENGL 001B with C or better and completion of the following with at least 2.500 GPA:

- ME 002
- ME 010
- ME 018A
- ME 018B
- MATH 009A or MATH 09HA
- MATH 009B or MATH 09HB
- MATH 009C or MATH 09HC
- PHYS 040A
- PHYS 040B

University Requirements

See Undergraduate Studies section.

College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Mechanical Engineering major uses the following major requirements to satisfy the college's Natural Sciences and Mathematics breadth requirement.

1. MATH 009A
2. PHYS 040A, PHYS 040B, PHYS 040C

Major Requirements

1. **Lower-division requirements** (78 units)
   a) CHEM 001A, CHEM 001B, CHEM 01LA, CHEM 01LB
   b) EE005
   c) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
   d) ME 002, ME 009, ME 010, ME 018A, ME 018B
   e) PHYS 040A, PHYS 040B, PHYS 040C
   f) STAT 010
2. **Upper-division requirements** (72 units)
   a) ME 100A, ME 103, ME 110, ME 113, ME 114, ME 116A, ME 118, ME 120, ME 135, ME 170A, ME 170B, ME 174, ME 175A, ME 175B, ME 175C
   b) Choose one Focus Area:
   (1) Materials and Structures
   Sixteen (16) units of technical electives chosen from ME100B, ME116B, ME121, ME122, ME134/MSE134, ME153, ME156, ME157/MSE143, ME158/MSE148, ME180, ME197
   (2) Energy and Environment
   Sixteen (16) units of technical electives chosen from ME 100B, ME 116B, ME 117, ME 136, ME 137, ME 138, ME 197
   (3) Design and Manufacturing
   Sixteen (16) units of technical electives chosen from ME 121, ME 122, ME 130, ME 131, ME 133, ME 140, ME 144/EE 144, ME 145, ME 153, ME 156, ME 175D, ME 176, ME 180, ME 197
   (4) General Mechanical Engineering
   Sixteen (16) units of technical electives chosen from the following list, in consultation with an advisor: ME 100B, ME 116B, ME 117, ME 121, ME 122, ME 130, ME 131, ME 133, ME 134/MSE 134, ME 136, ME 137, ME 138, ME 140, ME 144/EE 144, ME 145, ME 153, ME 156, ME157/MSE143, ME158/MSE148, ME180, ME 175D, ME 176, ME 180, ME 197

Visit the Student Affairs Office in the College of Engineering or **student.engr.ucr.edu** for a sample program.

Graduate Program

The Department of Mechanical Engineering offers graduate educational programs leading to M.S. and Ph.D. degrees in Mechanical Engineering. Broad areas of research include

1) mechanics and materials, 2) fluids and thermal sciences and 3) information computation and design. Specific research focus areas include the following:

- Air quality, small and large-scale pollutant dispersion in urban flows, turbulent combustion and wildland fire behavior, engine emissions and nanoparticle science, thermal and electrical properties of nanowires and nanotubes, direct energy conversion, porous media and multiphase transport, bioheat transfer, biomedical optics, and medical laser applications
- Wafer fab processing, thin film mechanics and nanotechnology, bio-inspired materials, mechanical behavior of thin films and other small-featured structures, mechanics of interfaces and surfaces, mechanical properties of carbon nanotubes and ferroelectric/piezoelectric materials, sensing and imaging, mechanics of geophysical materials, advanced material synthesis, composites, MEME, BioMEMS, biomedical devices, and processing of nanocrystalline materials
- Artificial intelligence, computer-aided design or manufacturing, process planning, sensor networks, and distributed computing and control

Visit **https://www.me.ucr.edu/research**, for detailed information on the research programs of individual faculty members.

Combined B.S. + M.S. Five-Year Program
The college offers a combined B.S. + M.S. program in Mechanical Engineering designed to lead to a Bachelor of Science degree as well as a Master of Science degree in five years. Applicants for this program must have a high school GPA above 3.6, complete the Entry Level Writing Requirement before matriculation, and have sufficient mathematics preparation to enroll in calculus in their first quarter as freshmen. Eight units of technical electives will count in both programs, reducing the total number of units required for the MS degree.

Interested students who are entering their junior year should check with their academic advisor for information on eligibility and other details.

Admission
In addition to the following requirements, all applicants must meet the general requirements of the Riverside Division of the Academic Senate and the UCR Graduate Council as set forth in this catalog under the Graduate Studies section.

Language Requirement
All international students whose first language is not English must demonstrate proficiency in spoken English by securing at least a "conditional pass" score on the TAST or SPEAK test before they can be appointed as a TA. However, to be considered for subsequent TA appointments, they must secure a "clear pass" on the TAST or SPEAK. The fee associated with this test is paid by the department for the first attempt only. The TAST or SPEAK requirement is, however, waived for international students who are appointed as GSRs or are self-supported throughout their studies at UCR.

Master's Degree
The Department of Mechanical Engineering offers the M.S. degree in Mechanical Engineering.

Admission
Applicants should have an undergraduate degree in engineering, physical sciences, or mathematics with a minimum overall GPA of 3.0 or equivalent (if GPA is not based on a 4.0 scale). All official transcripts and three letters of recommendation must be submitted for evaluation. Foreign students and permanent residents whose first language is not English must also submit an acceptable TOEFL test score prior to admittance; the minimum TOEFL exam score is 550 (paper-based) or 80 (internet- based).

The M.S. degree in Mechanical Engineering can be earned by either completing a thesis (Plan I), which reports a creative investigation of a defined problem, or passing a comprehensive examination (Plan II). A minimum of three quarters of residency is required. Students should enroll in 12 units each quarter unless the graduate advisor grants an exception.

Course work used to satisfy the student's undergraduate degree requirements may not be applied toward the 36-unit M.S. requirement.

Plan I (Thesis)
Requires completion of a minimum of 36 units of upper-division and graduate-level approved course work and submission of an acceptable thesis. At least 24 of these units must be in graduate courses (200-series courses), a minimum of twenty of these units being Mechanical Engineering graduate courses (ME 200 or higher, excluding ME 250, ME 290, ME 297, ME 298I, and ME 299). The student must take at least 3 units of seminar (ME 250) and at least 7 but no more than 11 units of directed or thesis research credits (ME 297 or ME 299). No more than 8 units of course work may be satisfied with directed studies (ME 290) or individual internship (ME 298I). Students must defend the thesis.

An acceptable M.S. thesis must be submitted. The M.S. thesis may be based on:

1. A research or advanced design project, either analytical, computational or experimental;
2. An extensive report consisting of theoretical, computational or experimental contribution to mechanical engineering.

The student's M.S. Thesis Committee is responsible for approving the thesis. The thesis committee is composed of three members (including the research advisor).

The Thesis Defense can be taken in one of the following modes: In-Person, Hybrid, or Remote. The chair of the exam committee will decide the mode, taking into consideration the constraints of the student and the committee members. Students taking the defense In-Person are expected to be present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to take the defense on campus in a video-enabled room that supports some members physically present and others remotely. If Remote is chosen, the student and all committee members attend remotely via video conferencing.

Plan II (Comprehensive Examination)
Requires completion of a minimum of 36 units of upper-division and graduate-level approved course work and successfully passing a comprehensive examination. At least 24 of these units must be in graduate courses (200 series courses), a minimum of twenty of these units being Mechanical Engineering graduate courses (ME 200 or higher, excluding ME 250, ME 290, ME 297, ME 298I, and ME 299). The student must take I unit of seminar (ME 250) and no more than 7 units of directed studies (ME 290) or individual internship (ME 298I). Guidelines for preparation to the comprehensive examination are detailed in the Graduate Student Handbook.

Normative Time to Degree
Two years

Refer to the department's graduate program guidelines for further details.

Doctoral Degree
The Department of Mechanical Engineering offers the Ph.D. degree in Mechanical Engineering.

Admission
Applicants should have an undergraduate degree in engineering, physical sciences, or mathematics with a minimum overall GPA of 3.0 or equivalent (if GPA is not based on a 4.0 scale). A master's degree is not required for admission to the Ph.D. program. All official transcripts and three letters of recommendation must be submitted for evaluation. Foreign students and permanent residents whose first language is not English must also submit an acceptable TOEFL test score prior to admittance; the minimum TOEFL exam score is 550 (paper-based) or 80 (internet-based). Students in the M.S. program of Mechanical Engineering who desire to pursue the Ph.D. degree must formally apply for admission to the Ph.D. program.

The procedure for satisfying the requirements for the Ph.D. degree in Mechanical Engineering at UCR consists of four principal parts:

1. Successful completion of an approved program of course work below
2. Passing a written and oral preliminary examination
3. Successful oral defense of a written dissertation proposal
4. Defense and approval of the dissertation

Course Work
A course work plan has to be formulated by the student in coordination with their research advisor or the program graduate advisor. It is understood that changes to this may occur as the student's research progresses. These changes should be documented after consultation with the research advisor or the program graduate advisor.

Core Course Work
Before the oral defense of the dissertation proposal at least 32 units of course work must be completed. This is excluding seminar and research credits. Of these a minimum of twenty-four graduate units must be in Mechanical Engineering courses (ME 200 or higher, excluding ME 250, ME 290, ME 297, ME 298I, and ME 299). Typically students also enroll in ME 250 and ME 297 units their first year. The student may be advised to take additional courses prior to advancement to candidacy.

Seminar Requirement
The student must also complete 6 units of ME 250 (seminar) prior to graduation. One unit of ME 250 is offered each quarter. These units do not have to be completed before the dissertation proposal defense.

Research Units
At least 36 units of directed or thesis research credits (ME 297 or ME 299) must be taken prior to graduation.

Courses taken as part of the Ph.D. requirement in Mechanical Engineering at UCR can be used to satisfy the course requirements for an M.S. in Mechanical Engineering at UCR and vice versa.

Normative Time to Degree
Five years

Refer to the department's graduate program guidelines for further details

Written and Oral Preliminary Examination
The examination aims to screen candidates for pursuing doctoral studies. It is administered by the graduate program committee and is composed of two sessions:

Session 1: Written Examination

Session 2: Oral Examination

Normally, both sessions are completed within a four-week period. The written examination is designed to test understanding of graduate-level mechanical engineering concepts and methods. It covers three subject areas to be selected by the student among the following: materials structure & properties, control systems, engineering analysis, fluid mechanics, heat transfer, thermodynamics, solid mechanics. Students are strongly encouraged to complete the relevant graduate-level course work for the selected subject areas. For details, consult the departmental guidelines. The oral examination assesses the student's ability to conduct independent research. Consult departmental guidelines for details. The preliminary examination is normally offered once every year at the beginning of the summer session.

Dissertation and Final Oral Examination
After successfully completing the preliminary examination, the student, with advice from the advisor, recommends a qualifying committee and prepares a dissertation proposal. The dissertation proposal consists of a written document and an oral presentation or defense. Typically, the student submits a dissertation proposal to the qualifying committee within one year after successfully completing the preliminary examination and completion of the required 24 units of graduate core courses. The qualifying committee chair normally schedules an oral defense within one month of the written proposal submission. The presentation is given only to the qualifying committee members. The student is advanced to candidacy after successfully completing this examination and all coursework.

After completing the dissertation research, a written draft copy of the completed dissertation must be submitted to the dissertation committee for review, evaluation, and determination of whether the draft thesis is ready for oral defense. Once a draft has been approved for defense, an oral defense of the dissertation is scheduled and is open to the entire academic community. This defense consists of a presentation, followed by a question-and-answer period conducted by the dissertation committee and the audience. After successfully defending the dissertation, the candidate must submit final copies of the dissertation that comply with the format requirements set forth by the Graduate Division. Copies are given to the department and the dissertation advisor, in addition to those required by the Graduate Division.

Consult departmental guidelines for appointments to qualifying and dissertation committees.

Refer to the department's graduate program guidelines for further details.

Format for Oral Qualifying Exam and Final Defense
The Oral Qualifying Exam and Final Defense can be taken in one of the following modes: In-Person, Hybrid, or Remote. The chair of the exam committee will decide the mode, taking into consideration the constraints of the student and the committee members. Students taking the exam or defense In-Person are expected to be present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to take the exam or the defense on campus in a video-enabled room that supports some members physically present and others remotely. If Remote is chosen, the student and all committee members attend remotely via video conferencing.

Lower-Division Courses

ME 002 Introduction to Mechanical Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 040A or PHYS 002A or PHYS 02HA or PHYS 040HA or PHYS 041A. An introduction to the field of mechanical engineering. Topics include the mechanical engineering profession; machine components; forces in structures and fluids; materials and stresses; thermal and energy systems; machine motion; and machine design.

ME 003 How Things Work: the Principles Behind Technology 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): none. Introduces the basic physical principles of engineering systems from everyday life such as automobiles, computers, and household appliances. Topics include conservation laws and the physics and chemistry of engineering systems. Does not confer credit towards a degree in the Bourns College of Engineering.

ME 004 Energy and the Environment 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): none. Covers energy conservation, energy sources, market dynamics, and climate change. Addresses cultural, political, and social trends and their impact on the ecosystem. Discusses renewable and nonrenewable energy sources. Technical background not required. Does not confer credit towards a degree in the Bourns College of Engineering.

ME 005 The Science of Mythbusting 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): none. Introduces to the scientific method for non-science majors. Explores the application of scientific concepts to test the validity of myths and events from news stories, movies, and other popular media. Provides critical reasoning skills necessary to interpret advertiser's product claims, critique information on the World Wide Web, and understand new technologies.

ME 009 Engineering Graphics and Design 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers graphical concepts and projective geometry relating to spatial visualization and communication in design. Includes technical sketching, computer-aided design with solid modeling, geometric dimensioning and tolerancing, and an introduction to the engineering design process.

ME 010 Statics 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MATH 009C, PHYS 040A or PHYS 040HA. Covers equilibrium of coplanar force systems; analysis of frames and trusses; noncoplanar force systems; friction; and distributed loads.

ME 018A Introduction to Engineering Computation 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MATH 009A with a grade of C- or better or MATH 09HA with a grade of C- or better; or equivalent. An introduction to the use of MATLAB in engineering computation. Covers scripts and functions, programming, input/output, and two- and three-dimensional graphing. Introduces data analysis, numerical analysis, and numerical solutions for engineering problems.

ME 018B Introduction to Computational Modeling in Mechanical Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 018A, PHYS 040A with a grade of C- or better or PHYS 041A with a grade of C- or better. Introduces the concepts of computational modeling in mechanical engineering. Topics include formulation of mathematical models to solve problems involving vector analysis, complex numbers, linear algebra, and differential, and integral calculus. Explores analytical and numerical solutions to problems in mechanical engineering.

Upper-Division Courses

ME 100A Thermodynamics 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MATH 010A, ME 018B with a grade of C- or better, PHYS 040B or PHYS 040HB. Introduces basic concepts and applications of thermodynamics relevant to mechanical engineering. Topics include work and energy, the first law of thermodynamics, properties of pure substances, system and control volume analysis, the Carnot cycle, heat and refrigeration cycles, the second law of thermodynamics, entropy, and reversible and irreversible processes. Credit is awarded for only one of CHE 100 or ME 100A.

ME 100B Thermodynamics 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): ME 100A. Topics include the second law of thermodynamics, entropy function, entropy production, analysis of cycles, vapor power systems, gas power systems, refrigeration and heat pump systems, equations of state, thermodynamic property relations, ideal gas mixtures and psychrometrics, multicomponent systems, combustion, and reacting mixtures.

ME 103 Dynamics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 046; ME 010 with a grade of C- or better; ME 018B with a grade of C- or better or CS 010B or MATH 031. Topics include vector representation of kinematics and kinetics of particles; Newton's laws of motion; force-mass-acceleration, work-energy, and impulse-momentum methods; kinetics of systems of particles and kinematics; and kinetics of rigid bodies.

ME 110 Mechanics of Materials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 010 with a grade of C- or better, MATH

046. Topics include mechanics of deformable bodies subjected to axial, torsional, shear, and bending loads; combined stresses; and their applications to the design of structures. Satisfactory(S) or No Credit(N/C) is not available.

ME 113 Fluid Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 046; PHYS 040B or PHYS 040HB; ME 002 with a grade of C- or better; ME 010 with a grade of C- or better; ME 018B with a grade of C- or better. Introduces principles of fluid mechanics relevant to mechanical engineering. Topics include shear stresses and viscosity, fluid statics, pressure, forces on submerged surfaces, Bernoulli and mechanical energy equations, control volume approach, mass conservation, momentum and energy equations, the differential approach, turbulent flow in pipes, and lift and drag. Credit is awarded for one of the following ME 113 or CHE 114.

ME 114 Introduction to Materials Science and Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001B, PHYS 040C or PHYS 040HC; upper-division standing. Covers materials classification, atomic structure and interatomic bonding, crystal structure of metals, imperfections in solids, diffusion, mechanical properties of engineering materials, strengthening mechanisms, basic concepts of fracture and fatigue, phase diagrams, ceramics, polymers, and composites.

ME 116A Heat Transfer 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MATH 046, ME 113 (ME 113 may be taken concurrently). Introduces the analysis of steady and transient heat conduction, fin and heat generating systems, two-dimensional conduction, internal and external forced convection, natural convection, radiation heat transfer, heat exchangers, and mass transfer. Credit is awarded for only one of CHE 116 or ME 116A.

ME 116B Heat Transfer 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): ME 116A. Covers analytical and numerical methods in heat transfer and fluid mechanics. Topics include heat conduction and convection, gaseous radiation, boiling and condensation, general aspects of phase change, mass transfer principles, multimode heat transfer and the simulation of thermal fields, and the heat transfer process.

ME 117 Combustion and Energy Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 100A; ME 113; ME 116A; for ME 117 online section; enrollment in the Online Master of Science in Engineering program; graduate standing. Discusses premixed and diffusion flames; fuel-air thermochemistry; combustion-driven engine design and operation; engine cycle analysis; fluid mechanics in engine components; pollutant formation; and gas turbines.

ME 118 Mechanical Engineering Modeling and Analysis 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MATH 046, ME 018B with a grade of C- or better. Introduces data analysis and modeling used in engineering through the software package MATLAB. Numerical methods include descriptive and inferential statistics, sampling and bootstrapping, fitting linear and nonlinear models to observed data, interpolation, numerical differentiation and integration, and solution of systems of ordinary differential equations. Final project involves the development and evaluation of a model for an engineering system. Credit is awarded for only one of ENGR 118 or ME 118.

ME 120 Linear Systems and Controls 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 005 or EE 030A, EE 030LA; CS 010B, MATH 031 or ME 018B. Introduces the modeling and analysis of dynamic systems, emphasizing the common features of mechanical, hydraulic, pneumatic, thermal, electrical, and electromechanical systems. Controls are introduced through state equations, equilibrium, linearization, stability, and time and frequency domain analysis.

ME 121 Feedback Control 4 Discussion, 1 hour; lecture, 3 hours. Prerequisite(s): ME 118; ME 120. Introduces the analysis and design of feedback control systems using classical control methods. Topics include control system terminology, block diagrams, analysis and design of control systems in the time and frequency domains, closed-loop stability, root locus, Bode plots, and an introduction to analysis in state-space. Credit is awarded for one of the following ME 121 or EE 132.

ME 122 Vibrations 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): ME 103. Covers free and forced vibration of discrete systems with and without damping resonance; matrix methods for multiple degree-of-freedom systems; normal modes, coupling, and normal coordinates; and use of energy methods.

ME 130 Kinematic and Dynamic Analysis of Mechanisms 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): ME 009, ME 103. Explores the kinematic analysis of planar mechanisms including linkages, cams, and gear trains. Introduces concepts of multibody dynamics.

ME 131 Design of Mechanisms 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ME 130. Involves design of planar, spherical, and spatial mechanisms using both exact and approximate graphical and analytical techniques. Requires a computer-aided design project.

ME 133 Introduction to Mechatronics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 005 or EE 030A, EE 030LA. Introduces hardware, software, sensors, actuators, physical systems models, and control theory in the context of control system implementation. Covers data acquisition (Labview), sensors, actuators, electric circuits and components, semiconductor electronics, logic circuits, signal processing using analog operational amplifiers, programmable logic controllers, and microcontroller programming and interfacing. Uses MATLAB and Simulink.

ME 134 Microstructural Transformations in Materials 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 114 or consent of instructor. An introductory study of the fundamentals (thermodynamics and kinetics) controlling microstructural transformations in materials and their application to both liquid-solid and solid-solid transformations. Focuses on the important transformations that ultimately control the microstructures and properties of crystalline solids. Cross-listed with MSE 134.

ME 135 Transport Phenomena 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): ME 100A, ME 113, ME 116A. Introduces new concepts of thermodynamics, fluid mechanics, and heat transfer: sychrometry, combustion, one-dimensional compressible flow, and turbomachinery. Integrates the most important concepts of transport of momentum, heat, and mass.

ME 136 Environmental Impacts of Energy Production and Conversion 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 100A; ME 113; ME 116A; for the ME 136 online version section; enrollment in the Online Master of Science in Engineering program; graduate standing. Covers thermodynamics, heat transfer, and fluid mechanics as applied to the examination of the environmental impacts of energy production and conversion. Topics include pollution associated with fossil fuel combustion, environmental impacts of energy use, turbulent transport of pollutants, and principles used in the design of pollution control equipment.

ME 137 Environmental Fluid Mechanics 4 Lecture, 3 hours; discussion 1 hour. Prerequisite(s): ME 100A, ME 113. Covers the application of fluid mechanics to flows in the atmosphere and oceans. Topics include hydrostatic balance, Coriolis effects, geostrophic balance, boundary layers, turbulence, tracer and heat transport.

ME 138 Transport Phenomena in Living Systems 4 Lecture, 3 hours; discussion 1 hour. Prerequisite(s): BIEN 105 or ME 113, MATH 046, PHYS 040B or PHYS 040HB. An introduction to the application of the basic conservation laws of mechanics (mass, linear momentum, and energy) to the modeling of complex biological systems. Emphasizes how these concepts can explain and predict life processes.

ME 140 Ship Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 103, ME 113. Covers ship hull form, static and dynamic stability, ship response to waves, grounding and flooding, numerical integration of complex three-dimensional curved shapes and mathematical modeling of curved surfaces. Explores engineering approximations necessary for applications of fundamental principles to complex engineering systems such as ships.

ME 143 Introduction to Robotic Manipulation 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 040A with a grade of C- or better, MATH 031 with a grade of C- or better or ME 018B with a grade of C- or better or CS 30M with a grade of C- or better, MATH 046 with a grade of C- or better; or equivalent. Introduces mathematical representations of the configuration and spatial motion of robotic

manipulators based on modern screw theory. Topics include forward, inverse, differential kinematics.

ME 144 Foundations of Robotics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 020B or MATH 031 or ME 018B; EE 016 or CS 010B or ME 118; EE 106 or CS 141 or ME 120; restricted to class level standing of junior, or senior; or consent of instructor. Provides foundational knowledge on analysis, control, and programming of robots. Considers configuration space; rigid body motion; forward, inverse, and velocity kinematics; dynamics; trajectory planning; robot motion control; localization and mapping; and robot ethics. Integrates hands-on labs to program robots in simulation and experimentally by reading and interpreting sensor data. Cross-listed with EE 144. Credit is awarded for one of the following EE 144, ME 144, or EE 283A.

ME 145 Robotic Planning and Kinematics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ME 120 or equivalent; or consent on instructor. Motion planning and kinematics topics with an emphasis in geometric reasoning, programming, and matrix computations. Motion planning includes configuration spaces, sensor-based planning, decomposition and sampling methods, and advanced planning algorithms. Kinematics includes reference frames, rotations and displacements, and kinematic motion models. Cross-listed with EE 145.

ME 148 Internal Combustion Engines 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 100A; ME 113; ME 116A; restricted to class level standing of junior, or senior; or consent of instructor. Covers engine types and their operation. Also addresses engine design and operating parameters, thermochemistry of fuel-air mixture, engine cycles, spark ignition and compressed ignition engines, and emissions. Credit is awarded for one of the following ME 148 or ME 248.

ME 151 Introduction to Microelectromechanical Systems (mems) Technology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MSE 001; restricted to class level standing of junior, or senior; or consent of instructor. Covers the fundamentals of MEMS technology including MEMS device design, fabrication, and characterization. Provides hands-on experience in crafting real MEMS devices from initial design to the prototyping stage. Cross-listed with MSE 141.

ME 153 Finite Element Methods 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 118. Covers weak form formulation, the Galerkin method and its computational implementation, mesh generation, data visualization, as well as programming finite element codes for practical engineering applications.

ME 156 Mechanical Behavior of Materials 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): senior standing; ME 110; ME 114. Introduces the theory and experimental techniques for testing the mechanical behavior of materials and structures. Covers the fundamental mechanisms of deformation and failure of metals, ceramics, polymers, composite materials, and electronic materials as well as structural design and materials selection.

ME 157 Failure Analysis and Prevention 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 114 with a grade of C or better; restricted to class level standing of senior; or consent of instructor. Topics include failure modes due to overload, fatigue, fracture, and creep. Also addresses statistical analysis, probability of failure, quality assurance, and elements of fracture mechanics. Cross-listed with MSE 143. Credit is awarded for one of the following ME 157, MSE 143, or MSE 233B.

ME 158 Advanced Solidification Processing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MSE 143 or ME 157; restricted to class level standing of senior; or consent of instructor. An overview of the fundamentals of solidification processing. Includes integrated interplay of heat flow, mass transport, and solid/liquid interfacial kinetics during discontinuous change of state from liquid to solid of single phase and polyphase materials. Cross-listed with MSE 148. Credit is awarded for one of the following MSE 148, ME 158, ME 279, or MSE 248C.

ME 170A Experimental Techniques 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 005; ME 018B with a grade of C- or better. Covers the principles and practice of measurement and control and the design and implementation of experiments. Topics include dimensional analysis, error analysis, signal-to-noise problems, filtering, data acquisition and data reduction, and statistical analysis. Includes experiments on the use of electronic devices and sensors and practice in technical report writing.

ME 170B Experimental Techniques 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): ME 103; ME 110; ME 113; ME 116A; ME 170A. Analysis and verification of engineering theory using laboratory measurements in advanced, project-oriented experiments. Involves fluid flow, heat transfer, structural dynamics, thermodynamic systems, and electromechanical systems.

ME 174 Machine Design 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 009, ME 103 (can be taken concurrently), ME 110, ME 114. An introduction to the fundamentals of strength-based design. Topics include deflection and stiffness, static failure, and fatigue failure.

ME 175A Professional Topics in Engineering 2 Lecture, 2 hours. Prerequisite(s): senior standing in Mechanical Engineering major; ME 009. Topics include technical communication, team work, project management, engineering economics, professional ethics, and computer-aided design. Satisfactory (S) or No Credit (NC) grading is not available.

ME 175B Mechanical Engineering Design 3 Lecture, 2 hours; laboratory, 2 hours. Prerequisite(s): senior standing in Mechanical Engineering. ME 113, ME 116A, ME 170A, ME 174, ME 175A (may be taken concurrently). Outlines the defining of a design problem and the conception and detail of the design solution. Explores design theory, design for safety, reliability, manufacture, and assembly. Graded In Progress (IP) until ME 175B and ME 175C are completed, at which time a final, letter grade is assigned.

ME 175C Mechanical Engineering Design 3 Lecture, 1 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): senior standing in Mechanical Engineering; ME 175B. Students create, test, and evaluate a prototype based on the project design generated in ME 175B. Lecture topics include prototyping techniques, design verification, and special topics in design. Satisfactory (S) or No Credit (NC) grading is not available.

ME 175D Technological Entrepreneurship 4 Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): senior standing in Mechanical Engineering. Introduces concepts of business and management required to convert a technology into a viable business. Topics include technological assessment, market analysis, strategy, decision making, legal and intellectual property issues in business, financial analysis, business ethics and communication. Satisfactory (S) or No Credit (NC) grading is not available

ME 176 Sustainable Product Design 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 103, ME 110, ME 113, ME 116A. Introduces the principles of sustainable product design. Topics include life cycle design; design for reliability, maintainability, and recycling/reuse/remanufacture; materials selection; and manufacturing processes. Includes project in which students analyze the environmental impact of a product and redesign it to reduce the impact. Credit is awarded for only one of ME 176 or ME 210.

ME 180 Optics and Lasers in Engineering 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): EE 005, MATH 010B; or equivalent; or consent of instructor. Introduces basic principles of optics and lasers, wave equations, interferometry, diffraction, Fourier optics, light-matter interactions, ultrafast and nonlinear optics, and nanophotonics. Frames introductory concepts with experimental design and computer analysis. Includes applications and analytical exercises with microscopy and spectroscopy, smart-phone camera hacks, thin-film and bulk materials characterization, and communication systems. Credit is awarded for one of the following ME 180 or ME 280.

ME 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): consent of instructor, department chair, and Mechanical Engineering Undergraduate Program Committee chair. Individual study to meet special curricular needs. Requires a final written report. Course is repeatable to a maximum of 9 units.

ME 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): consent of instructor and Mechanical

Engineering Undergraduate Program Committee chair. Directed research in a particular subject relevant to mechanical engineering. Requires a final written technical report. Course is repeatable to a maximum of 8 units

ME 198 R'course: Variable Topics 1 Activity, 3 hours. Prerequisite(s): permission needed from department; sophomore standing or better. An opportunity for UCR undergraduate students to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original course topics are variable and unique from other departmental course offerings, designed to highlight the student facilitators' expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 8 units.

Graduate Courses

ME 200 Methods of Engineering Analysis 4 Lecture, 4 hours. Prerequisite(s): graduate standing in engineering or consent of instructor. Topics include linear algebra theory, vector spaces, eigenvalue problems, complex analytic functions, contour integration, integral transforms, and basic methods for solving ordinary and partial differential equations in mechanical engineering applications.

ME 201 Computational Methods in Engineering 4 Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Explores numerical methods with computer applications. Topics include solution of nonlinear algebraic equations, solution of systems of linear equations, interpolation, integration, statistical description of data, model fitting, Fast Fourier Transform and applications, and numerical solution of ordinary and partial differential equations.

ME 202 Spectral Computational Methods 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): ME 200 or equivalent; ME 240A is recommended; graduate standing. Introduces data analysis, including discrete Fourier transforms, sampling theorem, and power spectra. Reviews Sturm-Liouville eigenfunction expansions, Gibbs phenomenon, convergence theorems, and Chebyschev transforms. Additional topics include Galerkin, tau, collocation, and pseudospectral methods, aliasing, time-advancement, and numerical stability. Explores applications to incompressible Navier-Stokes equations, compressible flows, reacting flows, and complex geometries. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable.

ME 203 Design and Analysis of Engineering Experiments 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):graduate standing or consent of instructor. ME 203 online section; enrollment in the Online Master-in-Science in Engineering program . Introduces research methods in engineering. Topics include design of experiments, basic statistical tools, data analysis in the time-domain and frequency domain, machine learning and pattern recognition approaches, and computational tools. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ME 210 Sustainable Product Design 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. ME 210 online section; enrollment in the Online Master-in-Science in Engineering program. Introduces the principles of sustainable product design. Topics include life cycle design; design for reliability, maintainability, and recycling/reuse/remanufacture; materials selection; and manufacturing processes. Includes project in which students analyze the environmental impact of a product and redesign it to reduce the impact. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for only one of ME 176 or ME 210.

ME 220 Optimal Control and Estimation 4 Lecture, 4 hour; term paper, 1 hour. Prerequisite(s): ME 120, ME 121 or equivalent; or consent of instructor. Introduces optimal control and estimation with specific focus on discrete time linear systems. Topics include analysis of discrete Riccati equations; asymptotic properties of optimal controllers; optimal tracking; an introduction to Receding Horizon control; derivation of the Kalman filter; Extended Kalman Filter; and Unscented Kalman filter. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 233.

ME 221 Kinematics and Dynamics of Robots 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces methods to describe the position, orientation, and location of a rigid body. Explores position, velocity, and acceleration analysis of serial and parallel manipulators. Examines statics, dynamics, and stiffness analysis of robotic manipulators. Introduces Lagrangian dynamics and applications to wrist mechanisms and tendon-driven manipulators.

ME 222 Robot Sensing and Navigation 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 236 or ME 236; ME 120; or equivalent; graduate standing; or consent of instructor. Topics include robot navigation; description of robot sensors and their characteristics; sensor data processing; feature extraction; and matching. Also covers representations of space for mapping; map-based localization; simultaneous localization and mapping; and image-based motion estimation. Cross-listed with EE 245.

ME 223 Secure and Reliable Control Systems 4 Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. ME 223 online section; enrollment in the Online Master-in-Science in Engineering program. An introductory study of fault-tolerant and secure control systems. Topics include models of dynamical systems; linear system theory; detectability of attacks and failures; model-based fault detection; analytical redundancy; unknown-input observers; statistical methods for fault detection; graphical models and structured system theory; and fault-tolerant control. Letter Grade or S/NC; no petition required.

ME 224 Computational Methods For Robotics 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Provides the students with the mathematical and computational tools used in many diverse areas of robotics. Topics include numerical tools for inverse kinematics, representation and manipulation of model data, optimization methods for obstacle avoidance, and simulation of robot dynamics. Covers popular computational environments for robotics.

ME 225 Design and Fabrication of Robots 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Reviews traditional precision machine design, electromagnetic driving systems, and integration principles. Also presents state-of-the-art actuators, sensors, transmissions, and fabrication methods with their applications to modern robotic systems. Provides extensive training in the modeling, design, and fabrication of mechatronic components and complete robotic systems.

ME 226 Vehicle Dynamics 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor; for the ME 226 online version section; enrollment in the Online Master of Science in Engineering program; graduate standing. Introduces concepts of forward, lateral, and roll dynamics of vehicles. Includes mechanics of tires, drivetrains, steering, and suspensions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ME 227 Vehicle Propulsion 4 Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. For ME 227 online section, enrollment in the Online Master-in-Science in Engineering program; graduate standing. Introduces concepts of vehicle energy and fuel consumption. Develops models of contemporary vehicle propulsion systems including internal combustion engines, electric propulsion, hybrid propulsion and fuel-cell based propulsion. Introduces concepts of supervisory control strategies for vehicle propulsion. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ME 228 Introduction to Automotive Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 100A; graduate standing or consent of instructor; For the ME 228 online section; enrollment in the Online Master-in-Science in Engineering program; knowledge of thermodynamics is recommended; graduate standing. Presents the fundamentals of automotive engineering at an introductory level. Topics include conventional powertrains and advanced powertrain systems as well as diverse aspects of automotive engineering.

ME 230 Computer-Aided Engineering Design 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. ME 230 online section; enrollment in the Online Master-in-Science in

Engineering program. Introduces fundamentals of interactive computer graphics, three-dimensional representations of curves and surfaces, Bezier parameterizations, and optimization methods. Demonstrates applications of computer graphics and computational geometry to mechanical system simulations, computer-aided design, and engineering design.

ME 231 Pen-Based Computing 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor; computer programming experience Introduces computational techniques for pen-based user interfaces. Covers fundamental issues such as ink segmentation, sketch parsing, and shape recognition. Explores the topic of sketch understanding, including reasoning about context and correcting errors. Also addresses issues related to building practical pen-based systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 233.

ME 232 Computational Design Tools 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An introduction to the theoretical foundations and practical application of computational techniques for engineering design. Topics include geometric modeling, numerical optimization, and artificial intelligence techniques. Includes programming projects in which both symbolic and numerical computational techniques are used to solve engineering problems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ME 233 Artificial Intelligence For Design 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Explores the application of artificial intelligence to engineering design. Topics include the use of search, knowledge-based systems, machine learning, and qualitative physical reasoning for design automation. Addresses the theory behind these techniques and issues related to their practical application. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes.

ME 234 Data Driven Modeling and Control 4 Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. For the ME 234 online section; enrollment in the Online Master-in-Science in Engineering program; graduate standing; or consent of instructor. Introduces methods and techniques for data-driven modeling and control of dynamical systems. Topics include prediction-error modeling, subspace methods, non-parametric modeling, experiment design, model validation, model-predictive control, model-free control, and hyperdimensional methods for modeling and control of nonlinear systems. May be Taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

ME 235 Linear System Theory 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): EE 132; graduate standing. Provides a review of linear algebra. Topics include the mathematical description of linear systems; the solution of state-space equations; controllability and observability; canonical and minimal realization; and state feedback, pole placement, observer design, and compensator design. Cross-listed with EE.235.

ME 236 State and Parameter Estimation Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 215 with a grade of C or better; graduate standing. Covers Fisher information, Cramer-Rao lower bound, efficiency, and sufficient statistics. Addresses minimum variance unbiased, best linear unbiased, maximum likelihood, least squares, maximum a posteriori, and mean-squared estimation. Also covers Weiner and Kalman filtering as well as applications in navigation, signal processing, machine learning, and dynamical systems. Cross-listed with EE 236.

ME 237 Nonlinear Systems and Control 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): EE 235 or ME 235; graduate standing. Explores nonlinear systems and control. Topics include nonlinear differential equations, second order nonlinear systems, equilibrium and phase portrait, limit cycle, harmonic analysis and describing function, Lyapunov stability theory, absolute stability, Popov and circle criterion, input-output stability, small gain theorem, averaging methods, and feedback linearization. Cross-listed with EE 237.

ME 238 Linear Multivariable Control 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): EE 235 or ME 235; graduate standing. Investigates multivariable feedback systems, stability, performance, uncertainty, and robustness. Topics include analysis and synthesis via matrix factorization; Q-parameterization and all stabilizing controllers; frequency domain methods; and H(insert infinity) design and structured singular value analysis. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 238.

ME 239 Optimal Control 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): EE 215, EE 235/ME 235; graduate standing. Presents the theory of stochastic optimal control systems and methods for their design and analysis. Covers principles of optimization; Lagrange's equation; linear-quadratic-Gaussian control; certainty-equivalence; the minimum principle; the Hamilton-Jacobi-Bellman equation; and the algebraic Ricatti equation. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 239.

ME 240A Fundamentals of Fluid Mechanics 4 Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. ME 240A online section; enrollment in the Online Master-in-Science in Engineering program. Introduction to fluid mechanics. Explores equations of motion, stress tensor, the Navier-Stokes equations, boundary conditions, exact solutions, vorticity, and boundary layers.

ME 240B Fundamentals of Fluid Mechanics 4 Lecture, 4 hours. Prerequisite(s): ME 240A ; graduate standing; or consent of instructor. Covers inviscid flow, the Euler and Bernouli equations, potential flow, and wing theory and introduces stability theory and turbulence.

ME 241A Fundamentals of Heat and Mass Transfer 4 Lecture, 4 hours. Prerequisite(s): ME 240A; graduate standing; or consent of instructor. Introduces in-depth derivations of equations and principles governing heat and mass transfer with an emphasis on formulation of problems. Topics include equations involved in conduction, convection, radiation, energy, and species conservation and the analytical and numerical solution of transport problems. Mechanical Engineering graduate students receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

ME 241B Transport Through Porous Media 4 Lecture, 4 hours. Prerequisite(s): graduate standing. Covers current theories on flow, heat, and mass transfer and the mechanisms of multiphase transport in porous media. Mechanical Engineering graduate students receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

ME 241C Electronic Cooling and Thermal Issues in Microelectronics 4 Lecture, 4 hours. Prerequisite(s): graduate standing. Discusses thermal issues associated with the life cycle of electronic products. Covers passive, active, and hybrid thermal management techniques, computational modeling approaches, and advanced thermal management concepts such as single phase, phase change and heat pipes. Mechanical Engineering graduate students receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

ME 242 Turbulence in Fluids 4 Lecture, 4 hours. Prerequisite(s): ME 240A; graduate standing; or consent of instructor. An introduction to the application of fundamental conservation laws of mechanics (mass, momentum, and energy) to the modeling of complex turbulent natural and human-made flows. Covers tensor notation, statistical and spectral analysis, and basic turbulent closure techniques, including understanding of turbulence with intuitive insight into the problems that cannot be rigorously solved. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

ME 243A Advanced Mechanical Engineering Thermodynamics I 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Reviews fundamental concepts in classical thermodynamics such as conservation of energy, entropy, thermodynamic cycles, and functions. Covers Maxwell relations, chemical potentials and stability criteria for thermodynamic systems. Applications include chemical equilibrium and reactions as well as

phase transitions, and diagrams. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ME 243B Advanced Mechanical Engineering Thermodynamics II 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduces the statistical foundations of thermodynamics. Presents the fundamental postulate of thermodynamics and uses microstatistics to derive entropy, pressure, temperature, chemical potential, and free energies. Covers kinetic theory of gasses. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ME 244 Nanoscale Heat Transfer and Energy Conversion 4 Lecture, 4 hours. Prerequisite(s): 2 of the following: MSE 207, ME 100A, ME 116A, EE 201, EE 202, MSE 217; or equivalents; graduate standing. Explores fundamental processes of energy transport and conversion at short length and time scales. Introduces classical and quantum-mechanical size effects on electrons, phonons, and photons. Topics include modes of energy storage, coupling between energy carriers, and electrical and thermal transport using the Boltzmann transport equation and/or kinetic theory. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 208B.

ME 245 Radiative Heat Transfer 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 116A or ME 116B or equivalent; graduate standing; or consent of instructor. Offers in-depth study of topics related to radiative heat transfer. Builds upon curriculum of radiation presented at the undergraduate level. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ME 246 Computational Fluid Dynamics With Applications 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ME 240A; graduate standing; or consent of instructor. Introduces finite difference, finite volume, and finite element; spectral methods, governing equations for nonreacting and reacting flows; and stability and convergence for steady and unsteady problems. Students use commercial computational fluid dynamics (CFD) software for the course project.

ME 248 Internal Combustion Engines 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): ME 100A; ME 113; ME 116A; graduate standing. For the ME 248 online section; enrollment in the Online Master-in-Science in Engineering program; graduate standing; or consent of instructor. Covers engine types and their operation. Also addresses engine design and operating parameters, thermochemistry of fuel-air mixture, engine cycles, spark ignition and compressed ignition engines, and emissions. Credit is awarded for one of the following ME 248 or ME 148.

ME 250 Seminar in Mechanical Engineering 1 or 2 Seminar, 1 or 2 units. Prerequisite(s): graduate standing. Seminar in selected topics in mechanical engineering presented by graduate students, staff, faculty, and invited speakers. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

ME 255 Transport Processes in the Atmospheric Boundary Layer 4 Lecture, 4 hours. Prerequisite(s): ME 100A or CHE 100, ME 113 or CHE 114, and ME 116A or CHE 116; graduate standing; or consent of instructor. Examines heat, mass, and momentum transport processes in the atmospheric boundary layer using current understanding of micrometeorology. Topics includes surface energy balance, Monin-Obukhov Similarity theory, and dispersion of pollutants in the atmospheric boundary layer. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ME 260 Continuum Mechanics 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers vector and tensor notation and analysis. Introduces the concept of deformation, strain, and stress tensors. Elaborates fundamental balance and conservation laws of mass, momentum, and energy. Describes constitutive equations for elastic, viscoelastic, and plastic solids; and ideal, compressible, and viscous fluids. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ME 261 Theory of Elasticity 4 Lecture, 4 hours. Prerequisite(s): ME 110; graduate standing; or consent of instructor. Introduction to tensors, strain, equations of motion, and constitutive equations. Topics include typical boundary value problems of classical elasticity, problems of plane strain and plane stress, and variational principles.

ME 266 Mechanics and Physics of Materials 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Course introduces students to topics related to Structure-Composition-Processing-Performance relationship of metallic materials. It will cover fundamentals of materials science, materials selection, processing and manufacturing. Materials design or selection-based approach and team activities will be utilized to enhance learning and presentation skills. Cross-listed with MSE 248B.

ME 267 Finite Element Methods in Solid Mechanics 4 Lecture, 4 hours. Prerequisite(s): ME 261; graduate standing; or consent of instructor. Covers the formulation and implementation of finite element methods, including the Galerkin and energy methods. Topics include the static and dynamic analysis of mechanical and multiphysical systems and techniques of automatic mesh generation.

ME 270 Introduction to Microelectromechanical Systems 4 Lecture, 4 hours. Prerequisite(s): ME 110, ME 114, or equivalents, for MSE 238 online section; enrollment in the Online Master-in-Science in Engineering program. An introduction to the design and fabrication of microelectromechanical systems (MEMS). Topics include micromachining processes; material properties; transduction; applications in mechanical, thermal, optical, radiation, and biological sensors and actuators; microfluidic devices; Bio-MEMS and applications; packaging and reliability concepts; and metrology techniques for MEMS. Cross-listed with MSE 238.

ME 271 Therapeutic Biomedical Microdevices 4 Lecture, 4 hours. Prerequisite(s): ME 270/MSE 238 or equivalent; graduate standing; or consent of instructor. An introduction to the application of micro device technology towards biomedical therapeutics. Topics include emerging micro device fabrication techniques, bio compatibility requirements, and applications in areas such as cardiovascular intervention, minimally-invasive drug delivery, neuroprosthetic interfaces, and cellular engineering. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

ME 272 Nanoscale Science and Engineering 4 Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. For the MSE 248A/ME 272 online sections: enrollment in the Online Master-in-Science in Engineering program; graduate standing. An overview of the machinery and science of the nanometer scale. Topics include patterning of materials via scanning probe lithography; electron beam lithography; nanoimprinting; self-assembly; mechanical, electrical, magnetic, and chemical properties of nanoparticles, nanotubes, nanowires, and biomolecules (DNA, protein); self-assembled monolayers; and nanocomposites and synthetic macromolecules. Cross-listed with MSE 248A.

ME 273 Principles and Designs of Micro Transducers 4 Lecture, 3 hours; term paper, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): ME 270 or MSE 238 or equivalent; graduate standing; or consent of instructor. Emphasizes physical principles and designs of microscopic sensors and actuators. Topics include macroscopic and microscopic physical phenomena and properties; signal processing; mechanical transducers; thermal transducers; electrical transducers; magnetic transducers; optical transducers; chemical and biological transducers; and applications in areas such as lab-on-a-chip, medical diagnosis and power MEMS.

ME 274 Plasma-Aided Manufacturing and Materials Processing 4 Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. For ME 274/MSE 208A online section: enrollment in the Online Master-in-Science in Engineering program; graduate standing. Covers the fundamentals of gaseous plasmas and the physics of both equilibrium and non-equilibrium discharges. Explores the basic techniques for plasma diagnostics. Discusses the use of plasmas as a materials processing medium for a variety of manufacturing processes. Includes topics such as the processing of nanostructured materials using plasmas. Cross-listed with MSE 208A.

ME 278 Imperfections in Solids 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers fundamentals of crystal structures and crystal defects. Includes the generation of point defects, nucleation

and propagation of dislocations, perfect and partial dislocations, twins, stacking faults, transformations, mechanics of semiconductor and metallic thin films, and multilayered structures. Cross-listed with MSE 218.

ME 279 Advanced Solidification Processing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MSE 134 or ME 134; graduate standing; or consent of instructor. An overview of the fundamentals of solidification processing. Includes integrated interplay of heat flow, mass transport, and solid/liquid (s/l) interfacial kinetics during discontinuous change of state from liquid to solid of single phase and polyphase materials. Cross-listed with MSE 248C. Credit is awarded for one of the following MSE 248C, ME 279, ME 158, or MSE 148.

ME 280 Optics and Lasers in Engineering and Applied Science 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Focuses on advanced understanding of optics. Includes wave equations, interferometry, diffraction, Fourier optics, light-matter interactions, ultrafast and nonlinear optics, and nanophotonics. Frames advanced concepts with experimental and numerical analysis. Applications include smart-phone camera hacks, imaging and microscopy, thin-film and bulk materials characterization, communication systems, spectroscopy, laser machining, and optical trapping. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following ME 280 or ME 180.

ME 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Individual study, directed by a faculty member, of selected topics in mechanical engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

ME 297 Directed Research 1 to 4 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Research conducted under the supervision of a faculty member on selected problems in mechanical engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ME 298I Individual Internship 1 to 12 Internship, 2 to 24 hours; written work, 1 to 12 hours. Prerequisite(s): graduate standing; consent of graduate advisor. An individual apprenticeship in Mechanical Engineering with an approved professional individual or organization. Includes academic work under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

ME 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing; consent of instructor. Research in mechanical engineering for the M.S. thesis or Ph.D. dissertation. Graded satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Course

ME 302 Apprentice Teaching 1 to 4 Seminar, 1 to 4 hours. Prerequisite(s): graduate standing; consent of instructor; appointment as a teaching assistant or an associate in Mechanical Engineering. Topics include effective teaching methods, such as those involved in leading discussion sections and preparing and grading examinations, and student-instructor relations in lower- and upper-division Mechanical Engineering courses. Required each quarter of teaching assistants and associates in Mechanical Engineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.



Mechanisms of Gene Expression and Regulation Studies Designated Emphasis

Subject abbreviation: GERS
School of Medicine

David Lo (Biomedical Sciences), Co-Director
Thomas Girke (Institue for Integrative Genome Biology), Co-Director
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Advisory Committee & Participating Faculty

Devin Binder (Biomedical Sciences)
Monica Carson (Biomedical Sciences)
Djurdjica Coss (Biomedical Sciences)
Iryna Ethell (Biomedical Sciences)
Emma Wilson (Biomedical Sciences)
Meera Nair (Biomedical Sciences)
Declan McCole (Biomedical Sciences)
David Lo (Biomedical Sciences)
Nicholas DiPatrizio (Biomedical Sciences)
Seema Tiwari-Woodruff (Biomedical Sciences)
Sika Zheng (Biomedical Sciences)
Karine LeRoch (Molecular, Cell and Systems Biology)
Frances Sladek (Molecular, Cell and Systems Biology)
Ted Karginov (Molecular, Cell and Systems Biology)
Yinsheng Wang (Chemistry)
Thomas Girke (Institute for Integrative Genome Biology)
Xinping Cui (Statistics)
Katherine Borkovich (Microbiology)
James Borneman (Microbiology)
Jason Stajich (Microbiology)
Shou-Wei Ding (Microbiology)

Designated Emphasis Requirements

The Designated Emphasis is an interdisciplinary graduate program of study to enhance student training in the field through a focused coursework across at least two departments. The program is optional and the courses used for the DE may not be counted toward MS or PhD requirements.

1. Three (3) courses (12 units) with a focus in basic principles of genetics gene regulation (epigenetics, non coding RNA) and bioinformatics will be selected from:

   MCBL 221 - Microbial Genetics

   CMDB 201 - Molecular Biology

   CMBD 203 - Advanced Genetics

   GEN 203 - Advanced Genetic Analysis of Model Organisms

   GEN 241 - Advances in Genomics

   GEN 242 - Data Analysis in Genome Biology

   GEN 206 - Gene Silencing

GEN 220 - Computational Analysis of High Throughput Biological Data

BPSC/BIOL 148 - Quantitative Genetics

EEOB 214 - Evolutionary Genetics

EEOB 216 - Theory of Evolution

ENTX 204 - Genome Maintenance and Stability

STAT 100A Introduction to Statistics

BPSC 234 – Statistical Genomics

STAT 110 - Biostatistical Methods in Life Sciences

CS234: Computational Methods for Biomolecular Data

CS238: Algorithmic Techniques in Computational Biology

Students must select courses with relevant content in consultation with the Designated Emphasis Advisory Committee comprising of three participating faculty including student's major professor. Students must select courses from at least two different departments. Undergraduate course taken to fulfill the requirement must be accompanied by a 292 course taken in the same quarter with extra work agreed upon by professor and student.

2. BMSC 222 (2 units): Special Topics in Biomedical Sciences with emphasis in Gene expression and regulation. The course will address the research pertaining to the student's interest and prepare trainees in applying the knowledge of basic principles in regulation of gene expression and bioinformatics data analysis of next generation sequencing approaches. Graded Satisfactory (S) or No Credit (NC)
3. Research Project: students will write a review article on a selected genetics/ bioinformatics/ regulation of gene expression topic. The review will be evaluated by the Designated Emphasis Advisory Committee. It is the committee's expectation that student will fulfill this component by submitting the review article for the journal publication in a pubmed indexed journal. Successful completion of this review is required for the Designated Emphasis completion.

   All requirements for the Designated Emphasis must be satisfied no later than one calendar year from the quarter in which candidate advances to candidacy in their PhD field; a minimum GPA of 3.0 is required for the Designated Emphasis completion.

Media and Cultural Studies

Subject abbreviation: MCS
College of Humanities, Arts, and Social Sciences

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Timothy Labor, Ph.D.
Judith Rodenbeck, Ph.D.
Dylan Rodríguez, Ph.D.
Freya Schiwy, Ph.D.
Setsu Shigematsu Ph.D.
Sherryl Vint, Ph.D.

Associate Professors

Derek Burrill, Ph.D.
Gloria Kim, Ph.D
Keith Harris, Ph.D.
Latipa, Ph.D.
Pat Morton, Ph.D.
Randol Contreras, Ph.D.
Tabassum "Ruhi" Khan, Ph.D.
Wendy Weiqun Su, Ph.D.

Assistant Professors

Angela Li, Ph.D.
Ilya Brookwell, Ph.D.

Major

The Media and Cultural Studies major is designed to provide students with the tools to become autonomous and creative critics of diverse media and cultural expressions. Students acquire a critical, interdisciplinary analytic skill set that is simultaneously local and transnational, pertinent to social justice and political movements, encompassing the theoretical and the practical.

MCS majors learn to approach the intersection of media and culture, such as film, video, television, art, video games, virtual reality, the built environment, multimedia, visual and digital cultures from critical interdisciplinary, global and local perspectives. How race, gender, class, sexuality, ethnicity as well as political economy, globalization and environmental justice intersect with media and culture is at the forefront of this program.

Students are encouraged to hone their skills through the practice of creative intervention in media environments, such as short form media and short form documentary production, graphic and audiovisual art, digital journalism (including blogs and videos), etc.

Students are encouraged to plot pathways with particular course topics and skill sets according to their individual interests in consultation with the Faculty Undergraduate Adviser. For example, students may want to focus on digital journalism, social documentary, the study of speculative fic-tion, film and media theory and critical analysis, etc.

MCS majors are prepared to participate actively in the creative industries and as independent cultural creators, as digital journalists and policy makers. With a strong critical and theoretical formation in the study of media and culture, students are also prepared to continue their learning in graduate school.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

1. Lower-division requirements (5 lower-division courses [at least 20 units]):

   a) MCS 001

      Students are required to take MCS 001 and must receive a "C-/above" in this course to declare MCS as their major. The department will consider grade petitions on a case-by-case basis.

   b) Any 3 of the following 7 courses:

      MCS 002, ART 004/MCS 004, MCS 005, MCS 010, MCS 015, MCS 020, AHS 020/ MCS 023

   c) One additional course (at least 4 units) from the following:

      ART 006/MCS006, MCS 009/MUS 007, MCS 015, CPLT 021/MCS021, AST 022/JPN 022/ MCS 022, GER 045/MCS 042, MCS 043/ RUSN 045, ITAL 045/MCS 044, FREN 045/ MCS 045, MCS 046/SPN 046, AST 047/KOR 047/MCS 047, AST 064/MCS 049/VNM 064, CRWT 066/MCS 066/TFDP 066

2. Upper-division requirements (minimum 9 upper-division courses [at least 36 units]):

   a) 6 upper division MCS courses (strongly recommended to be taken with MCS faculty) chosen from [24 units total] MCS 102, ANTH 103/MCS 103, ENGL 104/ MCS 104, MCS 105, MCS 106, MCS 107, MCS 108, MCS 109, MCS 110 (E-Z), MCS 111, GSST 112/LGBS 112/MCS 112, MCS 113, CPLT 134/GER 134/JPN 134/MCS 114, MCS 115, MCS 116, MCS 117, GER 118 (E-Z)/MCS 118 (E-Z), MCS 119A & MCS 119B, MCS 120, MCS 122, GSST 124/MCS 123/ SEAS 175, MCS 124, LNST 125 (E-Z)/MCS 125 (E- Z)/SPN 125 (E-Z), CPLT 126/GER 126/MCS 126, GSST 166/ MCS 127, MCS 128, MCS 129, MCS 130, ART 131/MCS 131, MCS 132, MCS 134, ART 135/MCS 135, ART 136/MCS 136, AHS 136/MCS 137, AHS 137/MCS 138, MCS 139/SOC 139, MCS 140, MCS 141/GER 125/CPLT 125/EUR 125, MCS 142/SEAS 172/GSST 122, MCS 143 (E-Z)/LGBS 143 (E-Z)/ENGL 143 (E- Z), ENGL 144 (E-Z)/MCS 144 (E-Z), ENGL145 (E-Z)/MCS 145 (E-Z), ENGL 146 (E-Z)/MCS 146 (E-Z), MCS 147, MCS 148, MCS 149, ART 150/MCS 150, DNCE 171 (E-Z)/MCS 151 (E-Z), DNCE 172 (E-Z)/MCS 152 (E-Z), DNCE 173 (E- Z)/MCS 153 (E-Z), MCS 154, MCS 155/ART 155, MCS 156 (E-Z), MCS 157, MCS 158, MCS 159/URST 159, MCS 160, DNCE 161/MCS 161, DNCE 162/MCS 162, ART 161/MCS 163, MCS 164, MCS 165,

MCS 166, MCS 167, MCS 168, MCS 169, MCS 171, MCS 172, MCS 173 (E-Z), MCS 174 (E-Z), MCS 177, MCS 178, MCS 179, MCS 180, MCS 181, MCS 184, MCS 185, MCS 186, MCS 187, MCS 188, MCS 190, MCS 193

b) 3 elective upper division courses [12 units total]. Majors are encouraged to take one production course but it is not required. ART 140, ART 145, ART 146 (E-Z), ART 155/MCS 155, ART 167, ART 168, ART 169 (EZ), ART 175, MCS1981, TFDP 101, TFDP 109, TFDP 132, TFDP 133, TFDP 135, TFDP 138, TFDP 145, TFDP 155, TFDP 156A, TFDP 156B, TFDP 157, TFDP 166A, TFDP 166B, TFDP 166C, TFDP 167, TFDP 168, TFDP 169

c) No more than four units of MCS 190 or MCS 193 and a total of four units of MCS 198-I may be applied may be applied towards the minimum requirement.

Minor

The Media and Cultural Studies minor provides an interdisciplinary examination of film, video, television, multimedia, visual and digital cultures with a primary emphasis on history and theory and a secondary focus on creative intervention in media environments through production.

A minimum of 24 units (two lower-division courses and four upper-division courses) are required.

1. Lower-division requirements (2 lower-division courses [at least 8 units]):
   a) MCS 001

      Students are required to take MCS 001 and must receive a "C-/above" in this course to declare MCS as their minor. The department will consider grade petitions on a case-by-case basis.

   b) 1 lower division course chosen from the following

      MCS 002, ART 004/MCS 004, MCS 005, MCS 010, MCS 015, MCS 020, AHS 020/MCS 023
2. Upper-division requirements (a minimum of 4 courses [at least 16 units])
   a) 4 upper division MCS courses (strongly recommended to be taken with MCS faculty) chosen from [at least 16 units]:

      MCS 102, ANTH 103/MCS 103, ENGL 104/MCS 104, MCS 105, MCS 106, MCS 107, MCS 108, MCS 109, MCS 110 (E-Z), MCS 111, GSST 112/LGBS 112/MCS 112, MCS 113, CPLT 134/GER 134/JPN 134/MCS 114, MCS 115, MCS 116, MCS 117, GER 118 (E-Z)/MCS 118 (E-Z), MCS 119A & MCS 119B, MCS 120, MCS 122, GSST 124/MCS 123/SEAS 175, MCS 124, LNST 125 (E-Z)/MCS 125 (E-Z)/SPN 125 (E-Z), CPLT 126/GER 126/MCS 126, GSST 166/MCS 127, MCS 128, MCS 129, MCS 130, ART 131/MCS 131, MCS 132, MCS 134, ART 135/MCS 135, ART 136/MCS 136, AHS 136/MCS 137, AHS 137/MCS 138, MCS 139/SOC 139, MCS 140, MCS 141/GER 125/CPLT 125/EUR125, MCS 142/SEAS 172/GSST 122, MCS 143 (E-Z)/LGBS 143 (E- Z)/ENGL 143 (E-Z), ENGL 144 (E-Z)/MCS 144 (E-Z), ENGL145 (E-Z)/MCS 145 (E-Z), ENGL 146 (E-Z)/MCS 146 (E-Z), MCS 147, MCS 148, MCS 149, ART 150/MCS 150, DNCE 171 (E-Z)/MCS 151 (E-Z), DNCE 172 (E-Z)/MCS 152 (E-Z), DNCE 173 (E-Z)/MCS 153 (E-Z), MCS 154, MCS 155/ART 155, MCS 156 (E-Z), MCS 157, MCS 158, MCS 159/URST 159, MCS 160, DNCE 161/MCS 161, DNCE 162/MCS 162, ART 161/MCS 163, MCS 164, MCS 165, MCS 166, MCS 167, MCS 168, MCS 169, MCS 171, MCS 172, MCS 173 (E-Z), MCS 174 (E-Z), MCS 177, MCS 178, MCS 179, MCS 180, MCS 181, MCS 184, MCS 185, MCS 186, MCS 187, MCS 188

   b) One media production course (4 units) chosen from the list below may be used towards the total of four upper division courses chosen from:

      ART 140, ART 145, ART 146 (E-Z), ART 155/MCS 155, ART 167, ART 168, ART 169 (E-Z), ART 175, CS 134, TFDP 101, TFDP 102, TFDP 109, TFDP 132, TFDP 133, TFDP 135, TFDP 138, TFDP 144, TFDP 145, TFDP 155, TFDP 156A, TFDP 156B, TFDP 157, TFDP 166A, TFDP 166B, TFDP 166C, TFDP 167, TFDP 168, TFDP 169

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Lower-Division Courses

MCS 001 Introduction to Media and Cultural Studies 4 Lecture, 3 hours; discussion, 1 hour. Examines media from economic, political, and cultural perspectives. Discusses their relation to U.S. export industries; democratic communication and the parliamentary process; and social trends. Explores how changes in media and associated technologies are akin to a new industrial revolution.

MCS 002 Introduction to Immersive Media 4 Lecture, 3 hours; workshop, 1 hour; individualized study, 2 hours. Prerequisite(s): MCS 001 with a grade of C- or better; or consent of instructor. Focuses on tools for fast prototyping interactive media. Combines contemporary board and pencil and paper game and card design with computer game design, VR, and digital/web production.

MCS 003 Immersive Media Production 4 Lecture, 3 hours; workshop, 1 hour; individualized study, 2 hours. Prerequisite(s): MCS 002 with a grade of B- or better; permission of the instructor (auditioned by portfolio); or consent of instructor. Focuses on creative activity. Students with existing expertise in a design field are brought together for a devised project.

MCS 004 Introduction to Moving Images: Film, Video and New Media 5 Lecture, 3 hours; studio 3; hours; screening, 3 hours. Prerequisite(s): none. Explores issues and skills of video/film/media art based in production, history, and theory of the moving image. Introduces basic production, editing concepts and techniques of live-action production, story boards, image editing, and final authoring. Examines the moving image through installation, documentary, experimental film, video art, sound art, and performance. Cross-listed with ART 004.

MCS 005 Media Studies: Theory and Practice 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces the broad field of media and communication studies, covers the history and the current state of various media industries, discusses Internet-based technological developments, examines media laws and policies, and explores the relationships among media, culture, society and audiences from different theoretical approaches.

MCS 006 Introduction to Contemporary Critical Issues in Art 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines basic principles and methodologies of theory as applied to the interpretation and creation of works of art. Includes screenings. Cross-listed with ART 006.

MCS 007 Digital Journalism and Society 4 Lecture, 3 hours; extra reading, 1 hour; written work, 1 hour; term paper, 1 hour. Prerequisite(s): none. Explores the emerging field of digital journalism. Discusses its theoretical, professional, and practical dimensions. Topics include history, technology, political economy, content, and pattern of digital journalism; innovative journalistic practices; and the impact of digital media on contemporary culture, politics, and society.

MCS 009 Music in Movies and Tv 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): none. An exploration of popular film and TV soundtrack music, emphasizing drama and musical style. Scene study features such films as The Matrix, Casablanca, The X-Files, and Altered States. Cross-listed with MUS 007.

MCS 010 Cultural Studies: Historical and Contemporary Perspectives 4 Lecture, 3 hours; discussion, 1 hour. Investigates culture through the frameworks of feminism, Marxism, and race theories. Analyzes the different methodologies cultural critics use to theorize subcultures, cultural policies, and consumption. Explores ways cultural works are not only produced and received but also distributed and circulated within national and transnational contexts.

MCS 011 Drug Markets as Conformity and Resistance 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour; written work, 2 hours. Prerequisite(s): none. Examines the emergence, stability, and decline of illegal drug markets. Analyzes the meanings, behaviors, and interactions of illegal drug market participants. Emphasizes the roles of economic, political, and criminal justice factors in shaping and influencing illegal drug markets.

MCS 012 Gangs: A Critical Analysis 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour; written work, 2 hours. Examines the origins, growth, and decline of gangs. Analyzes the meanings, behaviors, and interactions of gang members within their communities. Emphasizes the importance of the economy, politics, public perceptions, and historical context in shaping and influencing gang formation and structure.

MCS 015 Introduction to Television Studies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the study of television, including its stylistic conventions, primary genres, modes of production, economics, and important critical methodologies.

MCS 020 Introduction to Film Studies 4 Lecture, 3 hours; screening, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the formal and narrative principles of film construction and to various critical approaches to the cinema, such as auteur and genre theory. Provides an overview of world cinemas.

MCS 022 Introduction to Japanese Film 4 Lecture, 3 hours; discussion, 1 hour; screening, 2 hours. An introduction to major genres, styles, and creators in the Japanese film world. Focuses on formal analysis and critical writing about film. Works studied range from the samurai epics of Kurosawa to recent anime. All films have subtitles. No previous knowledge of Japanese language or culture required. Cross-listed with AST 022, and JPN 022.

MCS 023 Introduction to Media Art 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the impact of media technology on the visual arts from photography to the Internet. Addresses mechanical reproduction, perception, gender, sexuality, identity, interactivity, cybernetics, and popular culture. Cross-listed with AHS 020.

MCS 024 World Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Introduction to world cinema as a fusion of national and international, culturally specific, and globally universal characteristics. Topics include realism, the role of world wars, Hollywood's global reach, alternative aesthetics of third-world cinemas, cross-fertilization between Europe and Asia, and the function of international film festivals and the international film market. Cross-listed with CPLT 024.

MCS 025 Introduction to the Built Environment: Suburbia 4 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Introduces the history of suburbia from the Industrial Revolution to the present. Includes the rise of suburbs in England; classic suburbs in the United States; the spread of suburbs and mass transportation; the role of race and gender in suburbia; suburban sprawl in Southern California; and sustainability and suburban development. Cross-listed with URST 025.

MCS 026 Art of the Synthesizer 4 Lecture, 3 hours; discussion, 1 hour. Explores the history of synthesizers through the stories of pioneering electronic musicians. Introduces the concepts of modular synthesis through applied patch designs with virtual software. Cross-listed with MUS 026.

MCS 027 Introduction to Video Game Studies 4 Lecture, 3 hours; extra reading, 4 hours; written work, 1 hour. Offers an introduction to the critical study of video games. Considers questions about the meaning of play. Explores media form and content including video game representations and media effects on individuals and groups.

MCS 036 Food in Film 4 Lecture, 3 hours; discussion, 1 hour; screening, 3 hours. Explores the representation of food, cooking, and restaurants in films from different national traditions. Includes gender roles; sensuality and sexuality; social class and the economics of food; and excess and lack. Cross-listed with CPLT 027.

MCS 042 Introduction to German Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Introduction to the history of German cinema from the advent of the studio system to the present. Covers film in Germany, Switzerland, and Austria. Attention is paid to the work of German-speaking filmmakers living in other parts of the world. Instruction is in English; all films have subtitles. Cross-listed with GER 045.

MCS 044 Italian Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Covers major works of the Italian cinema from Neo-Realism to the present. Emphasizes the historical evolution and representation of major elements of Italian culture. Knowledge of Italian not required. Cross-listed with ITAL 045.

MCS 045 French Cinema 4 Lecture, 3 hours; discussion, 1 hour; screening, 3 hours. Examines the evolution of French cinema from the beginnings to the present. Emphasizes major themes and directors. Considers genre, film techniques, and concepts including social class, gender, race, nationality, and language. Films are subtitled in English and the course taught entirely in English. Cross-listed with FREN 045.

MCS 046 Introduction to Latin American Film 5 Lecture, 3 hours; screening, 3 hours, discussion,1 hour. Prerequisite(s): none. Provides an historical overview of Latin American film production. Introduces students to film industries, revolutionary cinema, the role of television, and recent international co-productions. Cross-listed with SPN 046.

MCS 047 Introduction to Korean Film 4 Lecture, 3 hours; screening, 2 hours; discussion, 1 hour. An introduction to the major directors and films of Korea. Covers the genres and periods of works produced from the 1960s to the present. All films have English subtitles. No previous knowledge of Korean language or culture required. Cross-listed with AST 047, and KOR 047.

MCS 048 Chinese Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. A study of selected films from China and Taiwan focusing on cultural context. Includes what to look for in these films; the interrelations with theater, photography, and literature; and how these films are understood as an art form. Cross-listed with AST 048, CHN 048, and CPLT 048.

MCS 049 Introduction to Vietnamese and Diasporic Film Culture 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Engages in critical viewing strategies and analytical visual critique. Explores the revival of film production in Vietnam following the Vietnam War, with a focus on the means of production, state control, and international distribution. Readings are in translation; classes conducted in English. Cross-listed with VNM 064, AST 064, and SEAS 064.

MCS 066 Screenwriting: How Movies Work 4 Lecture, 3 hours; discussion, 1 hour; screening, 8 hours per quarter. Prerequisite(s): none. An Introduction to writing for stage and screen. Addresses structure, character, dialogue, theme, and story. Cross-listed with CRWT 066, and TFDP 066.

MCS 069 The Politics of Public Space 4 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): none. Introduces theories and history of public space in modern cities. Topics include public space during the Industrial Revolution; modern planning and urban renewal; political uses of public space including demonstrations and occupations; privatization and policing of public spaces; and changing concepts of public and private space in contemporary society. Cross-listed with URST 069.

Upper-Division Courses

MCS 101 Race, Gender, and the Superhero 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the racialized and gendered construction of superheroes across the genres of comics, television, graphic novels, film, animation, Japanese manga and other digital forms. Content may emphasize themes of sustainability, and the history of superheroes in the US and Japan.

MCS 104 Film and Media Theory 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Covers different types of film and media theory. Addresses formalist, psychoanalytic, Marxist, feminist, and other approaches to the cinema and other media. Cross-listed with ENGL 104.

MCS 105 Global Communication 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper division standing or consent of instructor. Introduces a variety of theoretical perspectives that inform global communication and media studies. Compares different world media systems. Surveys global media conglomerates and explores global communication in a digital age.

MCS 106 Disability Culture and Media 4 Lecture, 3 hours; extra reading, 1 hours; written work, 1 hours; activity, 1 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines disability rights politics and activism through cultural production. Explores access to art production, aesthetics and disability, and the role of art in social change. Surveys several genres of art production including dance, theatre, language and visual arts, and film and video.

MCS 107 History of Documentary Film 4 Lecture, 3 hours; screening, 3 hours; written work, 2 hours; individualized study, 3 hours. Prerequisite(s): upper division standing or consent of instructor. Transnational survey of the documentary film from the silent era to the digital age. Topics include how to define nonfiction cinema; the social issue documentary of the 1930s; Cinema verite; propaganda; ethnographic media; the essay film; experimental forms; media activism; re-enactment;, and the role of changing technologies.

MCS 108 Electric Earth: Media Ecology Theory Culture 4 Seminar, 3 hours; individualized study, 3 hours. Prerequisite(s): MCS 001 with a grade of C- or better. Introduces media ecology theory and history. Explores key topics, concepts, and issues at the upper-division level. Develops methods for thinking about contemporary media ecology, examining objects such as smart cities, animal technologies, and the media saturated planet. Outside class assignments include readings and conducting individual research and writing projects.

MCS 109 Algorithms and Everyday Life 4 Seminar, 3 hours; individualized study,3 hours. Prerequisite(s): MCS 005 with a grade C- or better; Examines technologies including artificial intelligence, Tinder, and Uber to examine cultures of algorithms, data, and code. Explores the use of algorithms to shape futures, govern bodies, advance systemic violence, and conceal injustices. Also addresses the use of data to intervene in these unjust data scapes.

MCS 110 (E-Z) Topics in Film and Media History 4 Lecture, 3 hours; screening, 3 hours. Considers topics in the history of film and media with attention to their aesthetic, socio-political, and economic contexts. J. Film And Media History After World War II.

MCS 111 History of Media Theory 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper division standing or consent from instructor. Provides a historical trajectory of theories of evolving media effects. Explores methods that serve as reference points for mass communication research.

MCS 112 History of Queer Cinema 4 Lecture, 3 hours; screening, 3 hours; activity 2 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the aesthetic hallmarks, political impulses, and theoretical responses that distinguish queer cinema as a unique, important tradition within film history. Provides a historical overview of global, independent, Hollywood, and alternative queer production from the 1900s to the present. Cross-listed with LGBS 112, and GSST 112.

MCS 114 Cinematic War Memory 4 Lecture, 3 hours; screening, 2 hours; extra reading, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines cinematic confrontations involving World War II in Germany and Japan. Topics include desire between victims and perpetrators, representation of trauma, and ethical responsibility. All screenings have English subtitles. Cross-listed with CPLT 134, GER 134, and JPN 134.

MCS 115 Modern German History Through Film 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores twentieth-century German history through film. Includes World Wars I and II, inflation and polarization of classes, Nazi Germany, representations of the Holocaust, and a divided and reunited Germany. Cross-listed with GER 163, HISE 163, and CPLT 115.

MCS 116 On Networks: Digital Culture, Media, Technology 4 Seminar, 3 hours; workshop, 1 hour; research, 1 hour; individual study, 2 hours. Prerequisite(s): MCS 005. Examines theories, histories, forms, aesthetics, and cultures of the network. Establishes touchpoints of network theory and history and uncovers key topic areas. Addresses how networked life transforms understandings of individuality and concepts of agency and helps foster collective units, propagate contagious affect, and re-organize space and place.

MCS 117 Posthuman Bodies in Science, Media, and Culture 4 Seminar, 3 hours; workshop, 1 hour; research, 1 hour; individual study, 2 hours. Prerequisite(s): MCS 005. Introduces cultures and theories of posthuman media. Examines media technologies, representations, and representative practices in the sciences. Topics include biopolitics, posthumanism, ecosickness, and speculation. Approaches posthuman media studies with perspectives from queer theory, eco-feminist theory, and disability studies.

MCS 118 (E-Z) Topics in German Cinema 4 Lecture, 3 hours; screening, 3 hours. Study of selected films, directors, and movements in German film. Films are in German with English subtitles. No knowledge of German is required. Cross-listed with GER 118 (E-Z).

MCS 118E Weimar Cinema and After 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An investigation of the silent and sound films of the Weimar era, focusing on the works of Fritz Lang, G. W. Pabst, and F. W. Murnau and their impact on film directors such as Werner Herzog and Rainer W. Fassbinder. Includes readings in film theory and in the literature and cultural history of the period. Cross-listed with GER 118E.

MCS 118F The Cinema of Fritz Lang 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. In-depth study of the films of the Austrian-born director Fritz Lang (1890-1976), whose work spans the silent era, the Golden Age of Hollywood, and postwar Germany. Explores the evolution of film technique, changes in cinematic paradigms, and Lang's engagement with ideology. Cross-listed with GER 118F.

MCS 118G Film and the Holocaust 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the moral, philosophical, and cultural legacy of the Holocaust in documentary and narrative films. Films and selected theoretical and literary texts involve key issues such as truthfulness, politicization, marginalization, universalization, trivialization, abstraction, representation of trauma, abstraction, aestheticization, and testimonies. Cross-listed with GER 118G.

MCS 119A Topics in Memory and Resistance 1 4 Lecture, 1 hour; seminar, 1 hour; workshop, 1 hour; research, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introduces the theory, methods, ethics, and political stakes of Memory and Resistance work. Offers training in and application of needed media skills including the production of short-form media. Course is repeatable as content or topic changes to a maximum of 8 units.

MCS 119B Topics in Memory and Resistance 2 4 Lecture, 1 hour; seminar, 1 hour; workshop, 1 hour; research, 3 hours. Prerequisite(s): MCS 119A; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Expands upon the conceptual, technical, and creative work completed in previous quarters. Engages in a large-scale collaborative media project with a grassroots organization. Course is repeatable as content or topic changes to a maximum of 8 units.

MCS 120 Major Figures in Film and Media 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Intensive analysis of the work of a significant figure in film, television, or other media who functions as an "auteur" (e.g. an influential director, star, or producer). Course is repeatable as topics change to a maximum of 8 units.

MCS 121 Live-Streaming and Gaming Enthnography: Online Research Methods 4 Seminar, 3 hours; written work, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Develops a skill set of online research methods tailored to address questions concerning live-streaming, gaming, and online social media interaction.

MCS 122 Sustainability as the Future of Democracy 5 Lecture, 3 hours; screening, 3 hours; activity, 3 hours. Prerequisite(s): upper division standing or consent of instructor. A critical cultural analysis of the discourses underlining and validating the degradation and destruction of our natural environments, engendering vast income inequalities.

MCS 123 Asian American Women: Writing the Self in Literature and Film 4 Lecture, 3 hours; screening, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): MCS 010, upper-division standing, or consent of instructor. Analyzes Asian American autobiographies and films written and directed by women. Explores why the genre of autobiography is enabling and contentious within Asian American women's writings. Examines films to see how such women

filmmakers contend with memory, gender, and identity. Cross-listed with GSST 124, and SEAS 175.

MCS 124 Latin America, Democracy, and the Media 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the construct of democracy in Latin America related to various media. Introduces current political and cultural issues in multiple countries. Critically reflects on the concept of democracy and how different social actors understand democracy. Evaluates the role of media in democratic processes.

MCS 125 (E-Z) Topics in Latin American Film and Media 5 Lecture, 3 hours; extra reading, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Intensive formal, historical, and theoretical analysis of a theme or issue in Latin American film and media. E. Indigenous Video &latin Americ. Cross-listed with LNST 125 (E-Z), and SPN 125 (E-Z).

MCS 126 From Novel to Screen: Film Adaptations of German Literature 4 Lecture, 3 hours; screening, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to classic works of German literature and their film adaptations. Explores adaptations by film directors such as Welles, Kubrick, Visconti, and Fassbinder. Studies the nexus between literature, film, and theatre. Course conducted in English. Cross-listed with CPLT 126, and GER 126.

MCS 127 Chicana/O Cultural Studies and Gender Politics 4 Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the field of Chicana/o cultural studies and investigates the gender politics that attest to its intersectional approach. Considers how power and gendered politics have impacted the restructuring of the split subject in Chicana/o cultural studies. Cross-listed with GSST 166.

MCS 129 Disney: Producing Race, Gender and Sexuality 4 Lecture, 3 hours; extra reading, 1 hour; written work, 1 hour; activity 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Investigates the articulation of race, gender, sexuality, and class in Disney-based productions. Examines how globalization, capitalism and consumption intersect in the production of race, gender, class, disabilities and sexualities. Considers the relation between the Disney Corporation and cultures as commodities and imperialist corporate politics. Credit is awarded for only one of MCS 129 or MCS 129S.

MCS 129S Disney: Producing Race, Gender and Sexuality 5 Lecture, 3 hours; discussion, 1 hour; extra reading,1 hour; written work, 1 hour; activity, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Investigates the articulation of race, gender, sexuality, and class in Disney-based productions. Examines how globalization, capitalism and consumption intersect in the production of race, gender, class, disabilities and sexualities. Considers the relation between the Disney Corporation and cultures as commodities and imperialist corporate politics. Credit is awarded for only one of MCS 129 or MCS 129S. See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.

MCS 130 Filipino American Culture 4 Seminar, 3 hours; screening, 3 hours. Prerequisite(s): MCS 001. Explores the politics of a range of Filipino American expressive, performative, and creative forms (e.g., Pilipino Culture Night) video, art, fiction, theater, in tandem with the study of theoretical and socio-historical scholarship in the interdisciplinary field of Filipino American Studies. Cross-listed with SEAS 130.

MCS 131 Intermediate Photography and Digital Technology 4 Lecture, 3 hours; laboratory, 4 hours. Prerequisite(s): ART 003 or consent of instructor. Covers the complete cycle of photographic production from scanning to output. Emphasizes developing skill in creating digital photographic imagery for creative and cultural expression. Software and some digital equipment are provided. A 35mm single lens reflex (SLR) or digital cameras and flash drives are required. Course is repeatable to a maximum of 8 units. Cross-listed with ART 131.

MCS 132 Intersections of Media and Popular Culture 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): upper division standing or consent from instructor Examines the interconnections of media technologies, modes of audience engagement, and the political and economic contexts of audience formation. Focuses on production sites and distribution and consumption of media. Explores how theoretical frameworks converge in the examination of connections between cultural texts and social contexts and between media and society.

MCS 133 Mediating the Anthropocene 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines anthropogenic climate change and activism as cultural and media events.

MCS 134 Transmedia: Demonstration Project 4 Lecture, 2 hours; workshop, 1 hour; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces strategies for organizing and presenting materials, ideas, and arguments in various media. Includes visual, written, and audio texts; the spoken word; and performance.

MCS 135 Intermedia: Art, Media, and Culture 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of performance, photography, video, film, television, installation, and other related "intermedias." Focuses on intermedial artworks and how they are constructed, documented, analyzed, and viewed in the larger context of culture. Cross-listed with ART 135.

MCS 136 Installation and Site-Specific Art 4 Lecture, 3 hours; studio, 3 hours. Prerequisite(s): consent of instructor. Focuses on performance, photo installation, computer art, video/film, site-specific installation, sculpture, and/or other intermedia. Concentrates on production and analysis of site-specific art. Course is repeatable to a maximum of 8 units. Cross-listed with ART 136. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

MCS 137 History of Video Art 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. Traces the evolution of video art from the invention of the Portapak and early video collectives to the current ubiquity of video installation, single-channel, and multimedia art. Emphasizes video art in the United States. Cross-listed with AHS 136.

MCS 139 Mass Media and Popular Culture 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. A comparative analysis of the television, radio, record, cinema, and journalism industries as social institutions and a discussion of contemporary developments in mass communications theory. A study of the relationship between the social processes of modern society and the content of popular culture. Cross-listed with SOC 139.

MCS 140 Alternative Media Production and Social Movements 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the history, theory, and practice of alternative forms of media production. Focuses on how various media forms were used to disseminate information in order to motivate audiences to take action for social change. Provides opportunities to learn documentary making, experiment with media forms, and produce alternative media projects. Course is repeatable as topics change to a maximum of 12 units.

MCS 142 Gender in Southeast Asian Diasporic Literature and Film 5 Lecture, 3 hours; screening, 3 hours; written work, 1 hour; extra reading 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on former Indochinese refugees who are producing literature and films in the United States and France. Examines how the perception of Indochina has been constructed, particularly how the region has been gendered female in the colonial imaginary. Explores the return of Southeast Asian immigrants to the Western gaze. Cross-listed with GSST 122, and SEAS 172.

MCS 143 (E-Z) Gender, Sexuality, and Visual Cultures 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Intensive formal, historical, and theoretical analysis of gender and sexuality in film, television, and visual culture. Cross-listed with ENGL 143 (E-Z), and LGBS 143 (E-Z).

MCS 144 (E-Z) Race, Ethnicity, and Visual Culture 4 Lecture, 3 hours; screening, 3 hours. Intensive formal, historical, and theoretical analysis of race and ethnicity in film, television, and visual culture. Weekly screenings and readings. Cross-listed with ENGL 144 (E-Z).

MCS 145 (E-Z) Special Topics in Film and Visual Culture 4 Lecture, 3 hours; screening, 3 hours. An intensive formal, historical, and theoretical analysis of a theme or issue in film, media, television, and visual culture. Cross-listed with ENGL 145 (E-Z).

MCS 146 (E-Z) Special Topics in Technoculture and Digital Media 4 Lecture, 3 hours; screening, 3 hours. Advanced study of theories and practices of reader and audience interaction with technologies of cultural production in general and digital media in particular. Includes praxis-oriented composition or research. Cross-listed with ENGL 146 (E-Z).

MCS 147 Visual Culture and Afrofuturism 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the cultural production of space called Afrofuturism and the history of the black speculative arts. Includes how the speculative affects representations of race and blackness in literature, visual culture, and music.

MCS 148 Bodies in Motion: Cinema as Choreography 4 Lecture, 3 hours; discussion, 1 hour; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction of cinema as a kind of choreography. Examines how it sets bodies in motion both on and in front of the screen. Considers some of the ways bodily movement was understood philosophically, scientifically, and bureaucratically at the moment cinema emerged.

MCS 149 Between the Panels: Introduction to United States and Identity in Visual Culture 4 Lecture, 3 hours; extra reading, 2 hours; activity, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the history of the medium of comics In the United States. It will also examine the tensions between the mainstream focus of comics and graphic novels represented via the superhero genre and the alternatively diverse narratives that are afforded through the medium.

MCS 150 Intermediate Moving Images: Film Video and New Media 5 Lecture, 3 hours; studio, 3 hours; screening, 3 hours. Prerequisite(s): ART 004/MCS 004. Examines the moving image through installation, documentary, experimental film, video art, sound art, and performance. Builds upon production and editing concepts introduced in ART 004/MCS 004. Explores issues and skills of video/film/media art based in production, history, and theory of the moving image. Covers editing theory, lighting, and sound editing. Course is repeatable to a maximum of 10 units. Cross-listed with ART 150.

MCS 151 (E-Z) Filmic Bodies 4 For hours and prerequisites, see segment descriptions. Assesses a multiplicity of filmic genres through the portals of the dancing and mobilized body as related to race, gender, class, and other identifiers. Explores the politics of movement on film, the mechanics of making film work, and the political economy of dance on film. Dance experience is usually not required. Course is repeatable to a maximum of units. Cross-listed with DNCE 171 (E-Z).

MCS 151F Ethnographic Representation of Dance On Film: ". . . and Then They Danced 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes the juncture between representation and presentation in everyday dance genres on film. Explores race, class, tropes of authenticity, and ownership of cultural production through screenings, lectures, and theoretical writings. No previous dance experience required. Course is repeatable. Cross-listed with DNCE 171F.

MCS 151G Gender, Mechanization, and Shape 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Utilizes film, video, and texts to examine the relationship among gender, mechanization, and shape during the twentieth century. Focuses on the performing arts, industrial and technological design, and the relationship of visual culture to changing notions of gender. Course is repeatable. Cross-listed with DNCE171G.

MCS 151J Spectatorship 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the nature of film studies through the eyes of the audience. Uses film, videos, and texts (in addition to outside viewing of films in cinematic locales) to formulate how viewing film constructs the viewer's subjectivity and a film's cultural context. Course is repeatable. Cross-listed with DNCE 171J.

MCS 151K Attractions, Interruptions, Disruptions: Narrative Film:fight Scenes, Dance Sequences,special Effect 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes the way film regulates the movement of bodies on and off screen through narrative and what happens when the movement exceeds that regulations. Utilizes selected films to explore the fight scenes, dance sequences, and computer generated imagery in film. Includes screenings both in class and outside of class. Course is repeatable. Cross-listed with DNCE 171K.

MCS 151M Bollywood 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the vast corpus of films that constitute the genre called Bollywood. Focuses on the genre's music and dance styles. Includes weekly film screenings. No previous dance experience required. Course is repeatable. Cross-listed with DNCE171M.

MCS 152 (E-Z) Televisual Bodies 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Analyzes choreographic practices within television broadcast and marketing and their relation to popular culture. Also examines situational or tactical use and misuse of satellite, cablecast, and broadcast television by unintentional audiences that subsequently reconstitute themselves as communities via the programming. Focuses on video as an archival and/or choreographic tool. J. Corporations And Corporealities: Commercials, Culture, And Choreography; K. Television As Location: The Satellite Feed; M. Music Television (mtv) And Popular Culture. Course is repeatable to a maximum of units. Cross-listed with DNCE 172 (E-Z).

MCS 153 (E-Z) Digitized Bodies 4 Lecture, 3 hours; laboratory, 3 hours; screening, 1 hour. Prerequisite(s): MCS 020; restricted to class level standing of junior, or senior. Provides a theoretical approach to digital subjectivities, bodies in motion, products, and realities. Addresses issues of liveness, new media, mediated cultural identities, speed, transfer, telepresence, and coded and encoded sexuality within programming. Focuses primarily on the body-computer interface. J. Digital Games, Violence, And The Body; K. Virtual Subjectivity: Persona, Identity, And Body. Course is repeatable to a maximum of units. Cross-listed with DNCE 173 (E-Z).

MCS 154 Media, Gender, and Violence 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines media representations of women and violence. Topics include feminist and queer theory, pornography, sexual violence, state violence, censorship, militarization, policing, and intersections with race, ethnicity, class, sexualities, and citizenship. Analyzes cinema, television, video, gaming, digital, print, and other visual and acoustic media. Course repeatable as topics change to a maximum of 12 units.

MCS 155 Advanced Moving Images: Film, Video and New Media 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ART 150/MCS 150. Expands on skills introduced in ART 150/MCS 150. Explores issues and skills connected with video/film/media art based on the production, history, and theory of the moving image. Covers recording, editing theory, lighting, and sound mixing. Examines time-based media through installation, documentary, experimental film, video art, sound art, and performance. Course is repeatable to a maximum of 12 units. Cross-listed with ART 155.

MCS 156 (E-Z) South Asian Media and Cultures 4 Lecture, 3 hours; screening, 3 hours. Explores the construction of various South Asian media. Considers confluence of new technologies of production and distribution, as well as the liberalization and globalization of different economies and social structures. E. Bollywood.

MCS 157 Afrofuturism & the Visual Cultures of Horror 4 Lecture, 3 hours; activity, 1 hour; extra reading, 2 hours. Prerequisite(s): MCS 001, may be taken concurrently; or consent of instructor. An introduction to

the trope of the grotesque and the myriad societal fears regarding what the monster symbolizes in visual mediations of the horror genre. Analyzes the tensions between the imaginings of the monstrous and how identity is constructed and consumed.

MCS 158 Afrofuturism and the Politics of the Black Superhero 4 Lecture, 3 hours; extra reading, 2 hours; activity, 1 hour. Prerequisite(s): MCS 001, may be taken concurrently; or consent of instructor. This course deals with the political aspects of the superhero genre and its historical tensions with representations of black characters. It also deals with how black superheroes speak to the cultural production system called Afrofuturism and its inherent celebration of agency regarding black subjectivity in the comics medium.

MCS 159 Race, Space, and Identity 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the intersection of race, space, and identity in modern and contemporary culture. Explores the critical and constitutive importance of race in the built environment. Topics include the racialization of space; colonialism and colonial cities; expositions and world's fairs; segregation; race and the canon; decolonization; and urban renewal. Cross-listed with URST 159.

MCS 160 Race, State Violence, and Incarceration in the U.s. 4 Lecture, 3 hours; individual study, 6 hours; research, 1 hour; term paper, 2 hours. Prerequisite(s): MCS 010 with a grade of C- or better; or consent of instructor. Offers a historical, analytical, and theoretical examination of the cultural formation of criminalization and incarceration in the United States. Contextualizes the US carceral regime's roots in the cultural-political structures of racial chattel slavery, land conquest, settler colonization, and the statecraft of anti-Black violence.

MCS 161 Choreographing the Screen 4 Lecture, 3 hours; screening, 2 hours; term paper, 1 hour. Prerequisite(s): DNCE 019 (may be taken concurrently) or consent of instructor. Focuses on choreographing for the camera and the screen. Topics include video art, classic film choreography, music video, and digital dance technologies. Students prepare a choreographic piece for the camera as a final project. Cross-listed with DNCE 161.

MCS 162 Tool, Technology, Technique 4 Lecture, 3 hours; screening, 3 hours; laboratory, 3 hours. Prerequisite(s): DNCE 019 or MCS 019 or consent of instructor. Practicum in video and digital production with an emphasis on capturing and editing the moving body. Students are encouraged to bring their own video or digital recording device. Editing equipment will be available. Cross-listed with DNCE 162.

MCS 163 Special Topics in Art Criticism and Theory 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): MCS 001 with a grade of C- or better or ART 160 with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Advanced topics in contemporary art theory and criticism. Examines the reception, analysis, and theoretical underpinning of works of art in relation to contemporary and historical issues in the visual arts. Course is repeatable to a maximum of 12 units. Cross-listed with ART 161.

MCS 164 Digital Media and Participatory Citizenship 4 Workshop 3 project, 3 hours, Prerequisite(s): upper-division standing or consent of instructor. A critical analysis of the new media environment. Explores options of operating as producers of culture. Includes design of an innovative intervention for circulation in the evolving digital media environment, as well as evaluation of its contribution and possible impact. Course is repeatable with consent of department or as topics change to a maximum of 12 units.

MCS 167 Virtual Reality Beyond Images 4 Seminar, 3 hours; written work, 1 hour; extra reading, 4 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Probes human activity systems, citizenship, simulations, and being digital. Surveys the realities of past, present, and futures with a critical eye towards embodiment, subjectivity, positionality, and social justice.

MCS 168 Hong Kong Cinema: Gender, Genre, and the "New Wave 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Examines contemporary Hong Kong films, specifically the "New Wave" genre. Particular focus is on the sociopolitical conditions of Hong Kong and its relations with Great Britain and China, the linkages of which set the stage for the films and thematic concerns. Cross-listed with AST 186.

MCS 169 New Chinese Cinema 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020, upper-division standing or consent of instructor. A study of representative films from the People's Republic of China, with a focus on those made during the last decade. Conducted in English; most films have English subtitles. Cross-listed with AST 185, and CHN 185.

MCS 170 Senior Seminar On the Anthropocene 5 Seminar, 3 hours; field, 3 hours; written work, 3 hours. Prerequisite(s): MCS 108, MCS 109, MCS 122, MCS 140, MCS 163, MCS 177; or equivalent; restricted to class level standing of senior; restricted to major(s) Media and Cultural Studies; prior research and/or course work on sustainability, climate change, media or art production; and consent of instructor. Explores anthropogenic climate change.

MCS 171 Reel to Real: Latin American Film and Social Change 4 Seminar, 3 hours; screening, 3 hours. Prerequisite(s): SPN 110. Introduces Latin American film as it articulates with contemporary history and current events. Cross-listed with SPN 171.

MCS 172 Topics in Film and Media Genres 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Topics may include study of a specific film or media genre; comparative genre studies (including a survey of the history and theory of two or more genres); or analysis of the concept of genre in film and media studies. Each segment is repeatable as its content changes to a maximum of 8 units.

MCS 173 (E-Z) International Cinemas 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Considers non-Hollywood cinemas in the national, historical, political, and cultural contexts which produced them. E. Experimental And Avant-garde Film; F. French New Wave; G. New German Cinema; I. Italian Neorealism; M. Global Chinese Martial Arts Cinema; T. Third World Cinema; U. Global Perspective On The Vietnam War. Cross-listed with CPLT 173 (E-Z).

MCS 174 (E-Z) Comparative Studies in Film 4 Lecture, 3 hours; screening, 3 hours. Considers film in the context of the other arts. Compares the treatment of various themes or problems in film and other media. E. Film & Literature Avant-agarde. Cross-listed with CPLT 174 (E-Z).

MCS 175 Human and Nonhuman: Decolonial and Audiovisual Perspectives On Life On A Diminished Planet 4 Seminar, 3 hours; screening, 2 hours; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. A study of decolonial and audiovisual approaches to conceiving the human/nonhuman from Latin American perspectives. Examines issues of extractivism, environmental justice, the debate on living well, the relation between human and nonhuman, and how films illustrate these issues. Cross-listed with SEHE 143, and SPN 175.

MCS 176 The Holocaust in Literature, Film and Culture 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Examines the Shoah, the Hebrew term for the World War II genocide also known as The Holocaust. Reviews texts in multiple genres and media from Europe and Asia. Topics include the following: Resistance and Collaboration; the Role of Women; Hidden Children; The Yellow Star; Concentration Camps; Trauma; and Spectacle. Cross-listed with CPLT 176.

MCS 177 Indigenous Media 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines and compares the strategies indigenous videomakers use to counter the imperial gaze of cinema. Discusses possibilities for turning the art form of capitalism and colonialism into a tool for decolonization.

MCS 178 Berlin Metropolis in Literature, Film, Music, and Art 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An introduction to the metropolis Berlin as a gateway between the East and West. Explores topography of the city through film, art, music, and literary texts. Considers Berlin's dramatic

transformations as a microcosm of Germany and Europe's troubled history in the twentieth century. Course conducted in English. Cross-listed with AHS 120, CPLT 111, EUR 120, and GER 111.

MCS 179 Gender, Media, and Latin America 5 Lecture, 3 hours; screening 3 hours; research 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Explores the way Latin Americans have thought of and represented gender across a variety of media including essays, film, novel, short story, and performance. Compares the possibilities and limitations of these media for representing gender in the Latin American context. Cross-listed with LNST 109, SPN 179, and GSST 179.

MCS 180 Japanese Documentary 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Studies the history of Japanese documentary cinema. Teaches strategies for reading nonfiction visual narrative. Explores other forms of documentation controversial in modern Japanese history including oral testimony, photography, and internet activism. Topics may include war, war protest, peace activism, environmental activism, nuclear politics, and green energy. Course is repeatable as topics and instructor change to a maximum of 8 units. Cross-listed with JPN 180, and AST 180.

MCS 181 Existentialism in Literature, Film, and Culture 4 Lecture, 3 hours; screening, 2 hours; outside research, .5 hours; term paper, .5 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the Existentialist movement in literature, film, and culture. Texts range from essays, plays, and novels to documentary and fiction film. Topics include choice, subjectivity, and alienation. Cross-listed with FREN 181, and CPLT 181.

MCS 182 Topics in Television Genres 4 Lecture, 3 hours; screening, 3 hours; extra reading, 3 hours; written work, 3 hours. Prerequisite(s): MCS 015. An in-depth analysis of a selected television genre. May include history of the specific genre across time periods or may focus on a specific time period. Combines screenings of episodes and scholarly readings about the medium. Topics include aesthetics, political economy, and cultural critique. Course is repeatable as content or topic changes to a maximum of 8 units. Cross-listed with ENGL 182.

MCS 183 Special Topics in Television Culture 4 Lecture, 3 hours; written work, 3 hours; screening, 3 hours; extra reading, 3 hours. Prerequisite(s): MCS 015; or equivalent. Provides a comprehensive introduction to a particular debate in television studies. Topics vary with each offering and may include politics of representation; broadcast, cable and streaming; and in-depth analysis of a specific series. Combines historical with aesthetic approaches. Integrates screenings of episodes with scholarly readings. Course is repeatable as content or topic changes to a maximum of 8 units. Cross-listed with ENGL 183.

MCS 184 Japanese Media and Cultural Studies 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates Japanese media and culture including film, television, video games, manga (comics), anime, music, and print and digital media. Analyzes the function of media relating to issues of national identity, imperial culture, collective memory, and censorship. Includes transnational circulation of Japanese cultural forms, alternative media, and historical changes in technologies. Cross-listed with AST 184, and JPN 184.

MCS 185 Imagining the Nation: Film and Media in Latin America 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): MCS 020 or upper-division standing or consent of instructor. Study of the role of media and film in creating a national imaginary in Latin America. Focus is on one region or nation--such as the Andes, the Caribbean, Mexico, Argentina, or Chile--relating local history to the global context. Course is repeatable as topics change to a maximum of 8 units. Cross-listed with LNST 105, and SPN 185.

MCS 186 Media and Movements: Film, Video, Photography, and the Visual Arts 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on key cultural movements or developments is global arts over the past century. Provides a thematic history of the avant-garde and experimental arts including painting, sculpture, photography, video, film, performance, installation, and new media art. Cross-listed with AHS 186. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

MCS 187 Theorizing New Media 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing, consent of instructor. Approaches new media through its archaeology. Introduces theories of media and mediation, focusing on digital media and networked society. Draws from classic theory and from contemporary activist practice. See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.

MCS 188 Media & Militarism 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Studies the function and effects of militarism and media. Includes how militarism is represented through various media genres such as cinema, television, advertising, documentary films, video games, digital, and new media. Explores its intersection with gender, race, class, religion, and nation. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

MCS 189 Political Culture of Race and Policing: Domestic Warfare, Counterinsurgency, and Abolition 4 Lecture, 3 hours; individual study, 2 hours; written work, 1 hour. Prerequisite(s): MCS 010; or consent of instructor. Introduces a critical, analytical, and theoretical approach to the culture of modern police and policing focusing on the United States. Lectures and course assignments examine how the cultures of law-and-order and domestic warfare normalize antiblack, racist, and colonial state violence.

MCS 190 Special Studies 1 to 5 Consultation, 1 hour; individual study, 3 to 12 hours; term paper or project, 1-3 hours. Prerequisite(s): upper-division standing; consent of instructor and program chair. Faculty-driven individual study to meet special curricular needs. Requires a final paper or creative project. Course is repeatable to a maximum of 15 units.

MCS 192 Junior Seminar 1 to 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): MCS 001, MCS 010; restricted to class level standing of junior, or senior; restricted to major(s) Media and Cultural Studies; or consent of instructor. Critical study, practice, and assessment of cultural studies research methods. Course is repeatable to a maximum of 8 units.

MCS 193 Senior Seminar 4 Seminar, 3 hours; project, 3 hours. Prerequisite(s): senior standing or consent of instructor. Advanced research in various fields of faculty interest. Includes completion of a research paper and a class presentation of its contents. Topics vary from year to year. Course is repeatable to a maximum of 8 units. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

MCS 198 R'course: Variable Topics 1 Activity hours vary per R'Course proposal, Prerequisite(s): permission needed from department; sophomore standing or better. An opportunity for UCR undergraduate students to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original course topics are variable and unique from other departmental course offerings, designed to highlight the student facilitators' expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 8 units.

MCS 198I Individual Internship in Media and Cultural Studies 1 to 12 Consultation, 1 to 3 hours; internship, 1 to 12 hours; individual study 1 to 6 hours; term paper, 1 to 3 hours; written work, 2 to 6 hours. Prerequisite(s): upper-division standing; consent of instructor and the Media and Cultural Studies Chair. An internship in a professional organization or with an individual to gain skills and experience for a career in visual media. Requires the writing of reports, final paper, or the making of a creative project. Course is repeatable to a maximum of 16 units. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

Graduate Courses

MCS 201 Racial-Colonial (state) Violence 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Provides an intensive theoretical engagement with the structural, conceptual, and material regimes of gendered racist violence in the hegemonic modern North American period. Focuses on how state

and extra-state violence constitute-and are constituted by-gendered racism as a singular regime of social ordering.

MCS 202 Special Topics in Television Culture 4 Seminar, 3 hours; extra reading, 20 hours per quarter; term paper, 40 hours per quarter. Prerequisite(s): graduate standing; or consent of instructor. Intensive research in television studies. Includes screenings of series and readings in the scholarly tradition. Combines history of the medium, orientation to the field's critical terms and techniques, and analysis of aesthetic practices. Prepares for conducting independent research in the field using multiple methods. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 8 units.

MCS 278 Seminar in Minority Discourse 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Intensive study and research in cultural traditions formerly excluded from literary history, such as African American, Asian American, Chicano, and Native American. Includes cross-cultural studies in the representations of such marginalized groups. Topics may include the African American novel; border culture; nineteenth-century Black bodies; oral history, and literature. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content or topic changes. Cross-listed with ENGL 278.

MCS 280 Colloquium in Book, Archive and Manuscript Studies 2 Colloquium, 2 hours. Prerequisite(s): graduate standing. Addresses current research topics pertaining to the program in designated emphasis. Includes events conducted both on and off campus. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

MCS 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and department chair. A directed studies course designed to address special curricular problems. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade if specialized topics are studied. Course is repeatable.

MCS 292 Concurrent Analytical Studies in Media and Cultural Studies 1 to 4 Research, 3 to 12 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. To be taken concurrently with a 100-series course, but on an individual basis. Limited to research, criticism, and written work. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade if specialized topics are studied. Course is repeatable.

Professional Course

MCS 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 hours. Prerequisite(s): appointment as a teaching assistant; graduate standing. Supervised teaching in undergraduate Media and Cultural Studies courses. Required for all Media and Cultural Studies teaching assistants. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.

Medical and Health Humanities Designated Emphasis

College of Humanities, Arts, and Social Sciences

Allison Hedge Coke (Creative Writing), Director
allisonh@ucr.edu

Advisory Committee & Participating Faculty

Emily Rapp Black (Creative Writing)
Lucille Chia (History)
Allison Hedge Coke (Creative Writing)
William Dunlop (Psychology)
María Regina Firmino-Castillo (Dance)
Katie Ford (Creative Writing)
Kimberly Guerrero (Theater, Film, and Digital Production)
Rickerby Hinds (Theater and Film Studies)
Tamara Ho (Gender & Sexuality Studies)
Agnieszka Jaworska (Philosophy)
Gloria Chan-Sook Kim (Media & Culture Studies)
Matthew King (Religious Studies)
Jeanette Kohl (Art History)
Antoine Lentacker (History)
Goldberry Long (Creative Writing)
Luis Lara Malvacias (Dance)
Carla Mazzio (English)
Allison Merlin (Theater, Film, and Digital Production)
Yolanda Moses (Anthropology)
Worku Nida (Anthropology)
Dana Simmons (History)
Annika Speer (Theater, Film, and Digital Prodcution)
Jennifer Syvertsen (Anthropology)
Chikako Takeshita (Gender and Sexuality Studies)
Clifford Trafzer (History)
Sherryl Vint (English and Media and Culture Studies)
Fuson Wang (English)
Ni'Ja Whitson (Dance)
Brigham C. Willis (Pediatrics, School of Medicine)
Susan Zieger (English)

Designated Emphasis Requirements

The Designated Emphasis is a 16-unit interdisciplinary graduate course of study, requiring students to demonstrate focused coursework and research in the field. Two of the four required courses, if otherwise eligible, may count towards the student's Ph.D. requirements. There are two core requirements:

1. Four (4) graduate courses (16 units). Students will only be allowed to take one (1) undergraduate qualified course paired with a 292 in this DE. These courses must be taken in at least two different departments: ANTH 261, ANTH 262, ANTH 265, ANTH 281, CWPA 210, CWPA 279, CWPA 285, DNCE 254, DNCE 257, ENGL 247, ENGL 273, ENGL 274, ENGL 278, ETST 201, ETST 221, ETST 222, HIST 220, HIST 238, PHIL 261, PHIL 283, PSYC 225, PSYC 255, PSYC 262, RLST 224.

   Lower Division Courses: ANTH 143, ANTH 162, ANTH 166, ETST 116, GSST 106, GSST 141, GSST 161, GSST 171, GSST 189, HIST 107, LGBS 137, LGBS 152, PHIL 167, PHIL 168, 169E, TFDP 122

2. Submission of a research portfolio within one year after the quarter in which the student advances to candidacy. The portfolio, to be reviewed by a standing committee of the Medical and Health Humanities Faculty, will demonstrate significant research in the field, include two research papers (one research paper must be the product of one of the 4 unit qualifying courses) and syllabi from the four completed courses. The student will also submit a self-statement (of no more than 1000 words) articulating their particular research emphasis and expertise, and one Medical and Health Humanities syllabus created by student.

All requirements for the Designated Emphasis must be satisfied within one year after the quarter in which a student advances to candidacy in their Ph.D. field; a minimum GPA of 3.0 is required for the award of the Designated Emphasis.

Medical and Health Humanities Studies Minor

1. **Requirements (20 Units)**

   a) Four (4) units from MHHS 001

   b) Twelve (12) additional units, selected from the following streams. Students must take at least Four (4) units from two of the three groups.

   STREAM ONE: Science and Medicine. GSST 183; GSST 161; GSST 161S; GSST 171; GSST 189; HIST 106

   STREAM TWO: Society, Culture and Health. AHS 133; ANTH 160; ANTH 162; ANTH 166; ENGL 122Q; ENGL 141M; GSST 185; HISA 147/ETST 116; HIST 107; HIST 188E/AST188E; PHIL 112, PHIL 167; PHIL 168; RLST 110; RLST 122

   STREAM THREE: Arts in Wellness. CRWT 130; CRWT 134; CRWT 150; CRWT 155; CRWT 170; CRWT 176; DNCE 115E; DNCE 115G; DNCE 133; DNCE 134; DNCE 181; MCS 106; MCS 135/ART135; TFDP 122; TFDP 158; TFDP 191T

   c) Four (4) units from MHHS 191

   All students must take the introductory

course (MHHS 001) and the senior seminar. There is no required order in which elective courses must be taken but credit in MHHS 001 is required for entry into MHHS 191.

Students wishing to earn credit in Stream Three: Arts in Wellness must obtain consent from the instructor and MHHS Chair prior to enrolling in CRWT, DNCE, MCS, OR TFDP courses.

See Minors under the College of Humanities Arts and Social Sciences in the Colleges and Programs for additional information on minors.

Purpose

The Minor in Medical and Health Humanities Studies (MHHS) at UCR emphasizes the inextricable relationship between the Humanities, Social Sciences, and the Arts and their contributions to explicating health, illness, and medicine. This proposal fits within the growing national and international recognition of Medical and Health Humanities in providing students with the skills to perceive, understand, and document diverse human experiences in health and medicine. The three proposed streams; Science and Medicine, Society, Culture, and Health, and Arts in Wellness represent traditional foci in the fields of Medical and Health Humanities and are areas of faculty research and art making at UCR. The Minor will serve as the foundation for students to examine current and historical narratives, discourses, and artistic expressions of health, and emphasizes that health and pathology are not only the domain of medicine and biomedical sciences but also rich topics for interdisciplinary humanities and artistic inquiry. As an interdisciplinary field the our MHHS Minor expands the sites and measures of medicine beyond the clinical encounter. The intentional integration of Humanities, Social Sciences, and Arts is a recognition that medicine is best viewed not as in service or in opposition to the clinical and life sciences, but as generatively enmeshed with a biomedical culture and diverse understandings of what constitutes medicine, health, and wellness.

Committee in Charge

Carla Mazzio (English), Co-Chair
Fuson Wang (English), Co-Chair

Supporting Faculty

Gloria Chan-Sook Kim (Media & Culture Studies)
Lucille Chia (History)
María Regina Firmino-Castillo (Dance)
Katie Ford (Creative Writing)
Kimberly Guerrero (Theater, Film, and Digital Production)
Allison Hedge Coke (Creative Writing)
Tamara Ho (Gender & Sexuality Studies)
Matthew King (Religious Studies)
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Ni'Ja Whitson (Dance)
Susan Zieger (English)

Lower Division Courses: 4 Units, Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): none. Introduces medical and health humanities. Explores the importance of humanities and arts to medicine, the diverse understandings of health and illness, and the complex social and economic forces that inform how people are cared for during times of illness. Mandatory course in the Medical and Health Humanities minor.

Upper Division Courses: 4 Units, Seminar, 3 hours; activity, 2 hours; extra reading, 0.5 hour; research, 0.5 hour. Prerequisite(s): MHHS 001 with a grade of C- or better. Examines selected topics in the medical and health humanities from religion, anthropology, literature or history to creative arts. Analyzes the role of humanities in medicine. Develops skill sets through seminars with medical humanities experts. Mandatory course in the Medical and Health Humanities minor. Satisfactory (S) or No Credit (N/C) is not available.

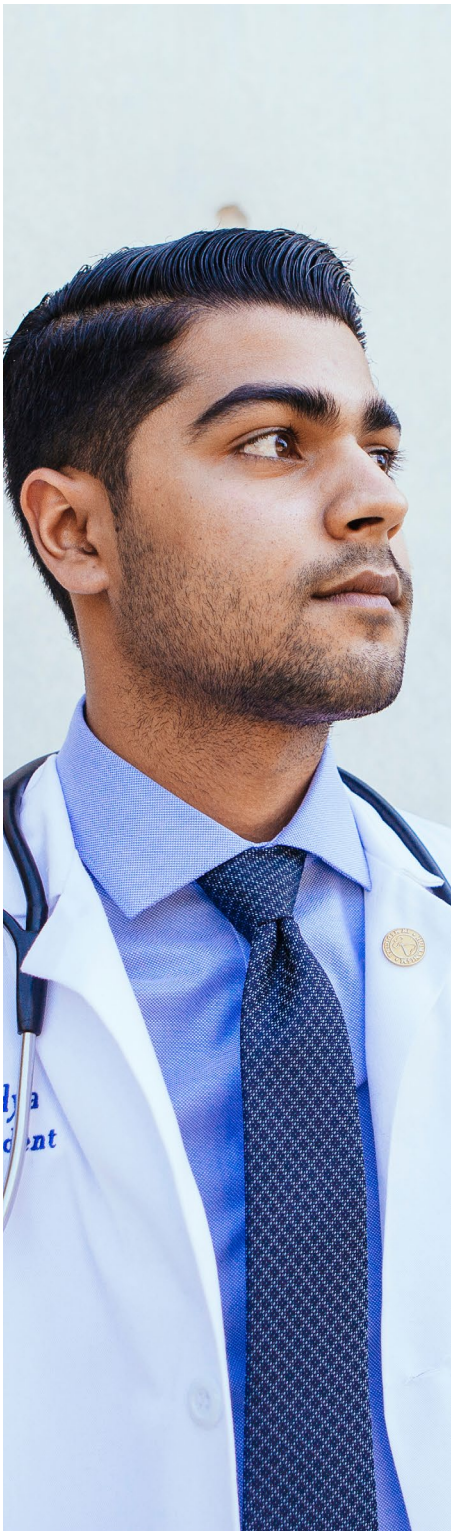
Lower-Division Courses

MHHS 001 Introduction to Medical and Health Humanities 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): none. Introduces medical and health humanities. Explores the importance of humanities and arts to medicine, the diverse understandings of health and illness, and the complex social and economic forces that inform how people are cared for during times of illness. Mandatory course in the Medical and Health Humanities minor.

MHHS 119 Meditation as Medicine: A Critical Exploration 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A critical exploration of the transformation of Buddhist meditation traditions over the last twenty-five centuries. Addresses the foundational techniques and debates in India; mass meditation as colonial resistance in Burma; recent interest in the brain sciences; and the commodification of mindfulness, compassion, and selflessness in the neoliberal marketplace. Cross-listed with AST 117, and RLST 119.

MHHS 131 The Buddha's Brain: Mind, Reality, and Power in the Buddhism-Science Dialogue 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A critical history of the "Buddhism-Science dialogue." Focuses on contested characterizations of mind, brain, and personhood. Includes reading and analyzing primary sources in the Indo-Tibetan Buddhist tradition alongside the brain sciences. Prepares for advanced courses and research in religious studies, the medical humanities, and Asian studies. Cross-listed with AST 131, and RLST 131.

MHHS 191 Seminar in Medical and Health Humanities 4 Seminar, 3 hours; activity, 2 hours; extra reading, 0.5 hour; research, 0.5 hour. Prerequisite(s): MHHS 001 with a grade of C- or better. Examines selected topics in the medical and health humanities from religion, anthropology, literature or history to creative arts. Analyzes the role of humanities in medicine. Develops skill sets through seminars with medical humanities experts. Mandatory course in the Medical and Health Humanities minor.



Medicine

Subject abbreviation: MDCL
School of Medicine
Division of Biomedical Sciences
Division of Clinical Sciences

Deborah Deas, M.D., M.P.H. Vice Chancellor, Health Sciences; the Mark and Pam Rubin Dean, UCR School of Medicine
Pablo Joo, M.D. Senior Associate Dean, Clinical Medical Education
Rajesh Gulati, M.D. Senior Associate Dean, Graduate Medical Education
Daniel Teraguchi, Ed.D. Executive Associate Dean, Student Affairs
Sherif Hassan, M.D., Ph.D. Executive Associate Dean, Pre-Clerkship Medical Education
Maria Aldana, M.B.A. Associate Dean and Chief Financial & Administrative Officer
Iryna Ethell, Ph.D. Associate Dean, Academic Affairs
Denise Martinez, M.D. Associate Dean, Diversity, Equity and Inclusion
Meera Nair, Ph.D. Associate Dean, Biomedical Research
Khiet Ngo, D.O., M.S. Associate Dean, Clinical Skills Education and Innovation
Hanh Nguyen, M.D., Associate Dean, Career Advising
Scott Pegan, Ph.D., Associate Dean, Pre-Clerkship Medical Education
Joel Purkiss, Ph.D. Associate Dean, Assessment and Evaluation
Robert Rodriguez, M.D., Associate Dean, Clinical Research
Katherine Browder, Assistant Dean, Strategic Initiatives and Chief of Staff
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Elizabeth Jacobs, M.D. Chair, Internal Medicine
Samar Nahas, M.D. Chair, Obstetrics and Gynecology
Sasidharan Ponthenkandath, M.D. Chair, Pediatrics
Arnold Tabuenca, M.D. Chair, Surgery
Mark Wolfson, Ph.D. Chair, Social Medicine, Population and Public Health, *William R. Johnson Jr. and S. Sue Johnson Endowed Chair*

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Ann Cheney, Ph.D. *Social Medicine, Population and Public Health*
Djurdjica Coss, Ph.D. *Endocrinology, Neuroscience*
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Nicholas DiPatrizio, Ph.D. *Biomedical Sciences*
Michael Drake, M.D. *Internal Medicine*
Iryna M. Ethell, Ph.D. *Biology, Biochemistry*
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Martin Garcia-Castro, Ph.D. *Molecular Biology*
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Lidia Kos, Ph.D. *Neurobiology*
David Lo, M.D. Ph.D. *Distinguished Professor, Genetics*
Declan McCole, Ph.D. *Physiology, Pharmacology*
Meera G. Nair, Ph.D. *Infectious Diseases, Mucosal Immunology*
Andre Obenaus, Ph.D. *Neurobiology*
Scott Pegan, Ph.D. *Chemistry and Biochemistry*
Maurizio Pellecchia, Ph.D. *Daniel Hays Endowed Chair in Cancer Research, Drug Discovery*
Robert Rodriguez, M.D., *Associate Dean, Clinical Research*
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Andrew Subica, Ph.D. *Social Medicine, Population and Public Health*
Seema K. Tiwari-Woodruff, Ph.D. *Neurodegenerative Diseases/Glia Biology*
Emma Wilson, Ph.D. *Parasite Immunologist*
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Kathryn DeFea, Ph.D. *Cell Biology, Biochemistry*
David A. Johnson, Ph.D. *Pharmacology*
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Jean-Pyo Lee, Ph.D. *Biomedical Sciences*
Joy Xiang, Ph.D. *Biomedical Sciences*
Natalie E. Zlebnik, Ph.D. *Neuroscience*

**

Professor in Residence

Devin Binder, M.D./Ph.D. *Clinical Neuroscience*
Michelle Porche, M.Ed., EdD, *Internal Medicine*

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Andrew Iraniha, M.D. *Surgery*
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Marshare Penny, DrPH, *Social Medicine, Population and Public Health*

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Clinical Instructor

Mary Ayad, M.D. *Internal Medicine*

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Mo Entezampour, Ph.D. *Internal Medicine*
Milton Hamblin, Ph.D. *Biomedical Sciences*
Fengyu Song, M.D. *Internal Medicine*
Zhenyun Yang, Ph.D. *Internal Medicine*

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To view a list of community-based faculty, visit **medschool.ucr.edu/community-based-faculty**

UCR School of Medicine

The mission of the UCR School of Medicine is to improve the health of the people of California and, especially, to serve Inland Southern California by training a diverse workforce of physicians and by developing innovative research and health care delivery programs that will improve the health of the medically underserved in the region and become models to be emulated throughout the state and nation.

With its opening in 2013, the UCR School of Medicine became the first new public medical school in California in more than four decades. It is expressly designed to meet the physician workforce needs in Inland Southern California and to improve the health of people living in the region. The school's community-based model provides medical students with clinical experiences in a variety of healthcare settings with diverse patient populations.

The UCR School of Medicine seeks students with diverse intellectual and life experiences. The school values broad academic backgrounds that include humanities, foreign language, social sciences and the arts to help prepare future physicians for interacting with increasingly diverse patient populations, health care professionals and colleagues. Each applicant's complete portfolio will be reviewed carefully in order to select students who are not only academically qualified but who have the breadth of volunteer/community and personal experiences to ensure that they will become physicians well prepared to care for the diverse population in our communities. **somsa.ucr.edu**

The Thomas Haider Program at the UCR School of Medicine is a special program within the school that provides a unique pathway into medical school for UCR students, with up to 24 seats filled by students who attend UCR for at least six consecutive quarters and complete their bachelor's degree at UCR. **somsa.ucr.edu/haider-program**

All School of Medicine applicants apply to the UCR School of Medicine through the American Medical College Application Service, at **students-residents.aamc.org/applying-medical-school-amcas/applying-medical-school-amcas**, following its guidelines and deadlines. Students may submit their applications at any time during the application period, as early as June (14 months before medical school classes begin in August at UCR) or as late as November 2 (9 months before classes begin). Applications without recent MCAT scores are considered incomplete. Review the application guidelines at **somsa.ucr.edu**.

The Program in Medical Education (PRIME) is designed to produce physicians who are specifically trained to address the healthcare needs of the African, Black, and Caribbean (ABC) communities of Inland Southern California. UCR's PRIME will admit six students annually, who will complete educational and clinical activities that prepare them to provide equitable care to ABC populations. The program begins with a two-week summer immersion program prior to the start of the academic school year. The School of Medicine will partner with ABC clinicians and organizations to allow students to integrate working with ABC populations throughout the course of their medical education. Students will have the option to pursue a master's degree (e.g., MPH, MPP, MBA, etc.) in the field of their choosing, before completing their final year of medical school. **https://ume.ucr.edu/prime**

Program Prerequisites

Pre-medical Education

The School of Medicine expects candidates to be well prepared to engage curriculum in the basic sciences. Applicants are expected to cover foundational areas to demonstrate the ability to succeed in medical school. Lab course hours do NOT count toward total semester hours.

Required Science Core

- Mathematics (8 semester hours) in calculus and/or statistics
- Physics (8 semester hours), labs optional
- General Chemistry, Organic Chemistry, Biochemistry (16 semester hours), labs optional
- Biology (8 semester hours), labs optional

Recommended Humanities Core

The School of Medicine seeks to develop the whole Student with curriculum that prepares future physicians to meet the needs of underserved communities. To that end, courses that emphasize culture, ethic, public health, spiritual practices, and other aspects of diversity are recommended. The committee appreciates candidates listing their humanities or social science courses in these subject areas.

- English, Writing, Composition, Logic or Critical Thinking (8 semester hours)
- Humanities/Social Science (8 semester hours)
- Spanish (3 semester hours)

Completion of Requirements

Students must complete all premedical requirements before beginning the first year of medical study, although these requirements need not be completed at the time application for admission is filed. AP credit with a score of 4 or 5 (or International Baccalaureate score of 6 or 7) can be used to satisfy all subjects.

Medical College Admission Test (MCAT)

The MCAT must be taken not later than fall of the year preceding admission to the School of Medicine. If more than one MCAT was taken, all the test grades must be included when making an application. The test must be repeated if, at the time of application, more than three years have elapsed since it was taken. Requests for test reports and all other correspondence and requests for information concerning the administration, processing, and scoring of the MCAT should be directed to the MCAT Program Office.

Additional details regarding application requirements and the admissions process can be found at **somsa.ucr.edu**

Academic Advising

UCR undergraduates receive academic advising from professional staff and faculty of the department or program of their chosen major. Professional staff and peer mentors in the medical school's Health Professions Advising Center are available to guide students in planning pre-health professions course work, gaining health-related experiences, completing service work and can assist with preparing to apply for admission to graduate and professional programs. **hpac.ucr.edu**

For more information

UCR School of Medicine
Office of Student Affairs
1682A School of Medicine Education Building
University of California, Riverside
Riverside, CA 92521
(951) 827-9017; **medadmissions@ucr.edu**

Medical/Professional Courses

MDCL 230 Introduction to Prime

Program 1 Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Introduces PRIME candidates to the overall expectations and requirements of the program. Course duration is two weeks. Pass/Fail

MDCL 231 Foundations of Medicine

I 10.5 Lecture, 67.5 hours per quarter; discussion, 30 hours per quarter; laboratory, 20.5 hours per quarter; clinic, 15 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime. Covers basic principles of disease processes, genetics, and molecular, cellular, and development biology. Instruction is driven by cases and accomplished through lectures and discovery in small group discussions, laboratories, and conferences. Also covers aspects of anatomy, doctoring, case-based learning, patient examination, and the longitudinal ambulatory clinical experience. Graded In Progress (IP) until MDCL 231, MDCL 232, MDCL 233, MDCL 234 and MDCL 235 are completed, at which time a final grade is assigned.

MDCL 232 Cardiovascular, Renal and Respiratory Sciences I 17.5 Lecture, 113 hours per quarter; discussion, 45 hours per quarter; laboratory, 28 hours per quarter; clinic, 36 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime. Covers physiology, pathophysiology, physical diagnosis and imaging in the cardiovascular, renal and respiratory sciences. Instruction is driven by cases and accomplished through lectures and discovery in small group discussions, laboratories, and conferences. Also covers aspects of anatomy, doctoring, case-based learning, patient examination, and the longitudinal ambulatory clinical experience. Graded In Progress (IP) until MDCL 231, MDCL 232, MDCL 233, MDCL 234 and MDCL 235 are completed, at which time a final grade is assigned.

MDCL 233 Gastrointestinal, Endocrine and Reproductive Health I 14 Lecture, 94 hours per quarter; discussion, 25 hours per quarter; laboratory, 33 hours per quarter; clinic, 34 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime. Covers biochemistry, pathophysiology, physical diagnosis & imaging associated with gastrointestinal endocrine & reproductive health. Instruction is driven by cases & accomplished through lectures and discovery in small group discussions, laboratories & conferences. Also covers aspects of anatomy, doctoring, case-based learning, patient examination, and the longitudinal ambulatory clinical experience. Graded In Progress (IP) until MDCL 231, MDCL 232, MDCL 233, MDCL 234 and MDCL 235 are completed, at which time a final grade is assigned.

MDCL 234 Musculoskeletal Medicine 8 Lecture, 50 hours per quarter; discussion, 14 hours per quarter; laboratory, 37 hours per quarter; clinic, 15 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime. Covers musculoskeletal system, biology & pathology of peripheral nervous system & physical diagnosis. Promotes discovery of learning by small group discussions, laboratories & conferences. Also covers aspects of anatomy, doctoring, case-based learning, patient examination, and the longitudinal ambulatory clinical experience. Graded In Progress (IP) until MDCL 231, MDCL 232, MDCL 233, MDCL 234 and MDCL 235 are completed, at which time a final grade is assigned.

MDCL 235 Clinical Neurosciences 1 9 Lecture, 51 hours per quarter; discussion, 24 hours per quarter; laboratory, 33 hours per quarter; clinic, 15 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime. Covers neurobiology & provides an introduction to neurology & psychiatry, as well as physical diagnosis & imaging of the nervous system. Promotes discovery of learning by small group discussions, laboratories & conferences. Also covers aspects of anatomy, doctoring, case-based learning, patient examination, and the longitudinal ambulatory clinical experience. Pass/Fail

MDCL 236 Foundations of Medicine 2 14 Lecture, 97 hours per quarter; discussion, 28 hours per quarter; laboratory, 10 hours per quarter; clinic, 42 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Covers pathophysiology, pharmacology, physical diagnosis & treatment of infectious diseases, clinical hematology, oncology, epidemiology & clinical reasoning skills. Utilizes weekly cases presented through lecture, small group discussion & laboratories. Also covers aspects of anatomy, doctoring, patient examination & LACE. Includes case-based learning. Graded In Progress (IP) until MDCL 236, MDCL 237, MDCL 238, MDCL 239 and MDCL 240 are completed, at which time a final grade of Pass is assigned. Credit is awarded for one of the following MDCL 236 or BMSC 236.

MDCL 237 Cardio, Renal & Resp Sciences 2 12 Lecture, 62 hours per quarter; discussion, 44 hours per quarter; laboratory, 36 hours per quarter; clinic, 33 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Advanced clinical perspective of anatomy, physiology, pathophysiology, physical diagnosis & imaging in the cardiovascular, renal & respiratory sciences. Utilizes weekly cases presented through lecture, small group discussions, laboratories & conferences. Also covers aspects of anatomy, doctoring, patient examination & LACE. Includes problem-based learning. Graded In Progress (IP) until MDCL 236, MDCL 237, MDCL 238, MDCL 239 and MDCL 240 are completed, at which time a final grade is assigned.

MDCL 238 Gastrointestinal, Endocrine and Reproductive Health 2 13 Lecture, 80 hours per quarter; discussion, 34 hours per quarter; laboratory, 18 hours per quarter; clinical 42 hours per quarter.Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Advanced clinical perspective of anatomy, biochemistry, pathophysiology, physical diagnosis & imaging associated with gastrointestinal, endocrine & reproductive health. Utilizes weekly cases presented through lecture, small group discussions, laboratories & conferences. Also covers aspects of anatomy, doctoring, patient examination & LACE. Includes problem-based learning. Graded In Progress (IP) until MDCL 236, MDCL 237, MDCL 238, MDCL 239 and MDCL 240 are completed, at which time a final grade is assigned.

MDCL 239 Clinical Neurosciences 2 10 Lecture, 74 hours per quarter; discussion, 20 hours per quarter; laboratory, 6 hours per quarter; clinical 18 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Covers advanced clinical perspective of neurology, neuropathology, psychiatry & neuropharmacology that is coordinated with physical & psychological clinical skills development. Utilizes weekly cases presented through lecture, small group discussions, laboratories & conferences. Also covers aspects of anatomy, doctoring, patient examination & LACE. Includes problem-based learning. Graded In Progress (IP) until MDCL 236, MDCL 237, MDCL 238, MDCL 239 and MDCL 240 are completed, at which time a final grade is assigned.

MDCL 240 Integrative Human Biology & Disease 3 Discussion, 30 hours per quarter. Prerequisite (s): sPrerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Reviews concepts of human biology and disease covered in MDCL 231, MDCL 232, MDCL 233, MDCL 234, MDCL 235, MDCL 236, MDCL 237, MDCL 238 and MDCL 239. Pass/Fail.

MDCL 241 Internal Medicine 10 Clinic, 40 hours. Prerequisite(s): restricted to department(s) School of Medicine; restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Internal Medicine. Pass/Fail/Honors Credit is awarded for one of the following MDCL 241 or MDCL 241A and MDCL 241B.

MDCL 241A Internal Medicine I 5 Clinic, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Internal Medicine. Part 1 of 2. Pass/Fail/Honors. Graded In Progress (IP) until MDCL 241A and 241B are completed, at which time a final grade is assigned. Credit is awarded for one of the following MDCL 241A and MDCL 241B, or MDCL 241.

MDCL 241B Internal Medicine II 5 Clinic, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Internal Medicine. Part 2 of 2. Pass/Fail/Honors Credit is awarded for one of the following MDCL 241A and MDCL 241B or MDCL 241.

MDCL 242 Surgery 10 Clinic, 40 hours. Prerequisite(s): restricted to department(s) School of Medicine; restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Surgery. Pass/Fail/Honors Credit is awarded for one of the following MDCL 242 or MDCL 242A and MDCL 242B.

MDCL 242A Surgery I 5 Clinic, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Surgery. Part 1 of 2. Graded In Progress (IP) until MDCL 242A and MDCL 242B are completed, at which time a final grade is assigned. Credit is awarded for one of the following MDCL 242A and MDCL 242B, or MDCL 242.

MDCL 242B Surgery II 5 Clinic, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Surgery. Part 2 of 2. Pass/Fail/Honors Credit is awarded for one of the following MDCL 242A and MDCL 242B or MDCL 242.

MDCL 243 Pediatrics 8 Clinic, 40 hours. Prerequisite(s): restricted to department(s) School of Medicine; restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Pediatrics. Pass/Fail/Honors Credit is awarded for one of the following MDCL 243 or MDCL 243A and MDCL 243B.

MDCL 243A Pediatrics I 4 Clinic, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Pediatrics. Part 1 of 2. Graded In Progress (IP) until MDCL 243A and MDCL 243B are completed, at which time a final grade is assigned. Credit is awarded for one of the following MDCL 243A and MDCL 243B or MDCL 243.

MDCL 243B Pediatrics II 4 Clinic, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Pediatrics. Part 2 of 2. Pass/Fail/Honors Credit is awarded for one of the following MDCL 243A and MDCL 243B or MDCL 243.

MDCL 244 Obstetrics/Gynecology 8 Clinic, 40 hours. Prerequisite(s): restricted to department(s) School of Medicine; restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Obstetrics/Gynecology. Pass/Fail/Honors Credit is awarded for one of the following MDCL 244 or MDCL 244A and MDCL 244B.

MDCL 244A Obstetrics/Gynecology I 4 Clinic, 126 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Obstetrics/Gynecology. Part 1 of 2. Graded In Progress (IP) until MDCL 244A and MDCL 244B are completed, at which time a final grade is assigned. Credit is awarded for one of the following MDCL 244A and MDCL 244B or MDCL 244.

MDCL 244B Obstetrics/Gynecology II 4 Clinic, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. hird year required clerkship in Obstetrics/Gynecology. Part 2 of 2. Pass/Fail/Honors Credit is awarded for one of the following MDCL 244A and MDCL 244B or MDCL 244.

MDCL 245 Family Medicine 5 Clinic, 40 hours. Prerequisite(s): restricted to department(s) School of Medicine; restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Family Medicine. Pass/Fail/Honors Credit is awarded for one of the following MDCL 245, or MDCL 245A and MDCL 245B.

MDCL 245A Family Medicine I 2.5 Clinic, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Family Medicine. Part 1 of 2. Graded In Progress (IP) until MDCL 245A and MDCL 245B are completed, at which time a final grade is assigned. Credit is awarded for one of the following MDCL 245A and MDCL 245B or MDCL 245.

MDCL 245B Family Medicine II 2.5 Clinic, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Family Medicine. Part 2 of 2. Pass/Fail/Honors Credit is awarded for one of the following MDCL 245A and MDCL 245B or MDCL 245.

MDCL 246 Psychiatry 5 Clinic, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Psychiatry. Pass/Fail/Honors Credit is awarded for one of the following MDCL 246 or MDCL 246A and MDCL 246B.

MDCL 246A Psychiatry I 2.5 Clinic, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Psychiatry. Part 1 of 2. Graded In Progress (IP) until MDCL 246A and MDCL 246B are completed, at which time a final grade is assigned. Credit is awarded for one of the following MDCL 246A and MDCL 246B or MDCL 246.

MDCL 246B Psychiatry II 2.5 Clinic, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Psychiatry. Part 2 of 2. Pass/Fail/Honors. Credit is awarded for one of the following MDCL 246A and MDCL 246B or MDCL 246.

MDCL 247 Emergency Medicine 2.5 Clinic, 40 hours. Prerequisite(s): restricted to department(s) School of Medicine; restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Emergency Medicine. Pass/Fail/Honors.

MDCL 248 Longitudinal Ambulatory Care Experience 4 Clinic, 39 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Longitudinal Ambulatory Care Experience. Eligibility to enroll is determined by the LACE director. Pass/Fail/Honors Credit is awarded for MDCL 248 or the sequence MDCL 248A, MDCL 248B, MDCL 248C, and MDCL 248D.

MDCL 248A Longitudinal Ambulatory Care Experience 1 1 Clinic, 3.6 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime. Third year required clerkship in Longitudinal Ambulatory Care Experience (LACE). Part 1 of 4. Pass/Fail/Honors Graded In Progress (IP) until MDCL 248A, MDCL 248B, MDCL 248C and MDCL 248D are completed, at which time a final grade is assigned. Credit is awarded for MDCL 248 or the sequence MDCL 248A, MDCL 248B, MDCL 248C, and MDCL 248D.

MDCL 248B Longitudinal Ambulatory Care Experience 2 1 Clinical, 36 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime. Third year required clerkship in Longitudinal Ambulatory Care Experience (LACE). Part 2 of 4. Pass/Fail/Honors Graded In Progress (IP) until MDCL 248A, MDCL 248B, MDCL 248C and MDCL 248D are completed, at which time a final grade is assigned. Credit is awarded for MDCL 248 or the sequence MDCL 248A, MDCL 248B, MDCL 248C, and MDCL 248D.

MDCL 248C Longitudinal Ambulatory Care Experience 3 1 Clinical, 36 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime. Third year required clerkship in Longitudinal Ambulatory Care Experience (LACE). Part 3 of 4. Pass/Fail/Honors Graded In Progress (IP) until MDCL 248A, MDCL 248B, MDCL 248C and MDCL 248D are completed, at which time a final grade is assigned. Credit is awarded for MDCL 248 or the sequence MDCL 248A, MDCL 248B, MDCL 248C, and MDCL 248D.

MDCL 248D Longitudinal Ambulatory Care Experience 4 1 Clinical, 36 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime. Third year required clerkship in Emergency Medicine. Part 4 of 4. Pass/Fail/Honors. Credit is awarded for MDCL 248 or the sequence MDCL 248A, MDCL 248B, MDCL 248C, and MDCL 248D.

MDCL 249 Neurology 2.5 Clinic, 40 hours. Prerequisite(s): restricted to department(s) School of Medicine; restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year required clerkship in Neurology. Pass/Fail/Honors.

MDCL 250 Clinical Sub-Internship 8 Clinical, 240 hours per quarter. Prerequisite (s): fourth year standing in Medical school. Fourth year required sub-internship in one of the following specialties: Emergency Medicine, Family Medicine, Internal Medicine, Pediatrics, Obstetrics/Gynecology, General Surgery, or Psychiatry. Course is repeatable as content/topics change. Pass/Fail/Honors.

MDCL 251 Radiology 8 Clinical, 240 hours per quarter . Prerequisite (s): fourth year standing in medical school. Fourth year required Radiology rotation. Pass/Fail/Honors.

MDCL 252 Critical Care 8 Clinical, 240 hours per quarter . Prerequisite (s): fourth year standing in medical school. Fourth year required Critical Care rotation. Pass/Fail/Honors.

MDCL 253 Transition to Residency 8 Clinic, 240 hours per quarter. Prerequisite(s): restricted to major(s) Medicine. Fourth year required Transition to Clerkship experience. Pass/Fail/Honors

MDCL 254 Fourth Year Elective 8 Clinical, 240 hours per quarter . Prerequisite (s): fourth year standing in medical school. Fourth year required elective rotation. Pass/Fail/Honors.

MDCL 289 Y1 & Y2 Electives 1 to 3 Lecture, 3 to 9 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime. Seminar course presenting various relevant topics in medicine. Content and instructor(s) may vary each time course is offered. Course is repeatable as content or topic changes. Pass/Fail.

MDCL 290 Directed Studies 1 to 6 Lecture, 3 to 18 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Experimental or literature studies on specifically selected topics under direction of a staff member. Course is repeatable. Pass/Fail.

MDCL 291 Transition to Clerkship 1 Lecture, 40 hours. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Two week orientation to third year clerkships. Pass/Fail

MDCL 293 Third Year Clinical Electives 1 Clinic, 10 hours per quarter. Prerequisite(s): restricted to major(s) Medicine, Medicine-Prime; and consent of instructor. Third year medical school elective. Course is repeatable as content or topic changes. Pass/Fail/Honors.

Microbiology

Subject abbreviation: MCBL
College of Natural and Agricultural Sciences

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Graduate Program, 3411 Boyce Hall
(800) 735-0717 or (951) 827-5688
microbiology.ucr.edu

James Borneman, Ph.D. Chair, Microbiology Undergraduate Steering Committee
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Professors

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Emma Aronson, Ph.D. (Microbiology and Plant Pathology)
Boris Baer, Ph.D. (Entomology)
Katherine A. Borkovich, Ph.D. (Plant Pathology and Microbiology)
James Borneman, Ph.D. (Microbiology and Plant Pathology)
Martin Garcia-Castro, PhD (Biomedical Sciences)
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Alec Gerry, Ph.D. (Entomology)
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Ron Hai, Ph.D (Microbiology and Plant Pathology)
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Georgios Vidalakis, Ph.D. (Microbiology and Plant Pathology)
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Emma Wilson, Ph.D. (School of Medicine)

Professors Emeriti

Michael Allen, Ph.D. (Microbiology and Plant Pathology)
Michael D. Coffey, Ph.D. (Microbiology and Plant Pathology)
Donald A. Cooksey, Ph.D. (Microbiology and Plant Pathology)
David E. Crowley, Ph.D. (Environmental Sciences)
Brian A. Federici, Ph.D. (Entomology)
Thomas Miller, Ph.D. (Entomology)
Edward Platzer, Ph.D. (Evolution, Ecology and Organismal Biology and Nematology)
A.L.N. Rao, Ph.D. (Microbiology and Plant Pathology)
Philip Roberts, Ph.D. (Nematology)
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Marylynn V. Yates, Ph.D. (Environmental Sciences)

Associate Professors

Gregor Blaha, Ph.D. (Biochemistry)
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Xin Ge, Ph.D. (Chemical and Environmental Sciences)
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Samantha Ying, Ph.D. (Environmental Sciences)

Assistant Professors

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Joseph Genereux, Ph.D. (Chemistry)
Robert Jinkerson, Ph.D. (Chemical and Environmental Engineering)
Yanran Li, Ph.D. (Chemical and Environmental Engineering)
Juliet Morrison, Ph.D. (Microbiology and Plant Pathology)
Jason A. Rohman, PhD.
Jiue-in Yang, Ph.D. (Nematology)

Major

Microorganisms play key roles in ecosystems and human civilization. They can both cause and prevent a wide array of diseases in animals and plants. They are key components in the manufacturing of bread, cheese, and other food products. Microbes are involved in soil formation, global environmental processes and detoxifying contaminated environments. In addition, they contain a wealth of useful compounds and enzymes for biotechnology.

The Microbiology major is unique because it offers research based capstone course (MCBL 125) that trains students to become research scientists. The major also offers many laboratory courses enabling students to obtain highly valuable skills.

Students earning a degree will be prepared to continue studies at the graduate level, earn teaching credentials, or enter professional schools in medicine, pharmacy, optometry, dentistry, veterinary medicine, and clinical laboratory science among others. Students will also be trained for technical careers in medicine, agriculture, biotechnology and environmental fields. For information on how to select elective coursework for specific career paths, visit the CNAS Undergraduate Academic Advising Center.

Students in the Microbiology major can obtain either B.A. or B.A. degrees or both B.S. and M.S. in our combined program. The B.S. degree offers students with a strong interest in the natural sciences an opportunity to emphasize this aspect of their education. The B.A. degree is available to students who wish to obtain a broader background in the humanities and social sciences than is required of students in the B.S. program.

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Natural and Agricultural Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

Major Requirements

Some of the following requirements for the Microbiology major may also fulfill the College's breadth requirements. Consult with an advisor for course planning.

1. **Core Curriculum (72-73 units)**
   Students must complete all required core curriculum courses with a grade of "C-" or better and with a cumulative GPA in the courses of at least 2.0. Grades of "D" or "F" in two required courses, either separate courses or repetitions of the same course, are grounds for discontinuation from the major.
   a) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C
   b) CHEM 001A and CHEM 01LA or CHEM 01HA and CHEM 1HLA, CHEM 001B and CHEM 01LB or CHEM 01HB and CHEM 1HLB, CHEM 001C and CHEM 01LC or CHEM 01HC and CHEM 1HLC
   c) CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC
   d) PHYS 002A and PHYS 02LA or PHYS 02HA and PHYS 02HLA, PHYS 002B and PHYS 02LB or PHYS 02HB and PHYS 02HLB, PHYS 002C and PHYS 02LC or PHYS 02HC and PHYS 02HLC, or PHYS 040A, PHYS 040B, PHYS 040C
   e) MATH 007A or MATH 009A, MATH 007B or MATH 009B
   f) STAT 010
   g) BCH 100 or BCH 100H or BCH 110A or BCH 110HA
2. **Upper-Division Requirements (37-38 units)**
   a) Major Core (19-20 units): BIOL 102, BIOL 107A, MCBL 121/BIOL 121 or MCBL 131,

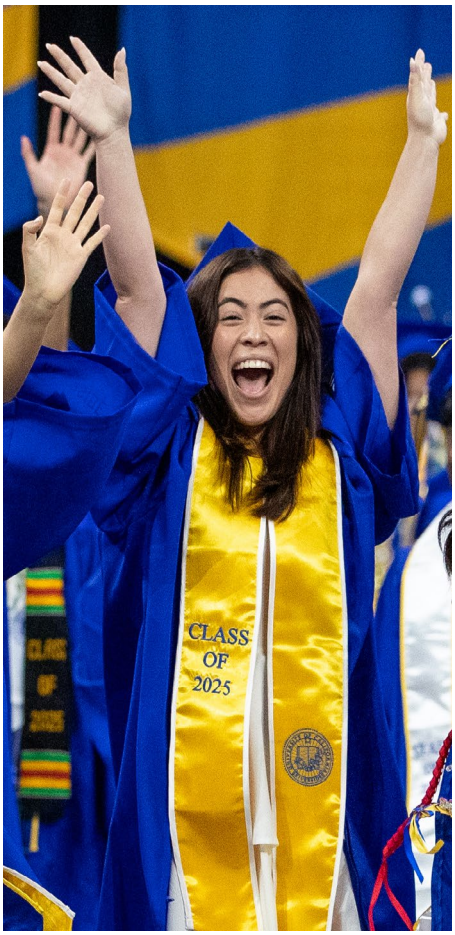
MCBL 121L/BIOL 121L or MCBL 131L, MCBL 125

b) Major Electives. A minimum of 18 units from the following to be selected in consultation with a faculty advisor: BIOL 128/CBNS 128, BIOL 157, BIOL 158, CBNS 101, ENSC 120/NEM 120, MCBL 120/BIOL 120/PLPA 120, MCBL 120L/ BIOL 120L/PLPA 120L, MCBL 122/BIOL 122, MCBL 123/BIOL 123/PLPA 123, MCBL 124/BIOL 124, MCBL 125 (when repeated), MCBL 126, MCBL 127, MCBL 128, MCBL 129, MCBL/ENSC 133, MCBL 139, MCBL 190[2], MCBL 197[2], NEM 159/BIOL 159, PLPA 134/BIOL 134, PLPA 134L/BIOL 134L

3. **Depth Requirements**

For the Bachelor of Science degree, an additional 16 units in upper-division microbiology courses and/or substantive courses in a field or fields related to the major. Acceptable courses include any course not used to fulfill requirements under b) Major Electives, BCH 162, BIOL 107B, BIOL 109, BIOL 119, and MCBL 198-I[3]. Some lower-division courses can also be applied such as STAT 010, STAT 011, MATH 009C, MATH 010A, or CS 009A. A more complete list of acceptable courses is available at the CNAS Undergraduate Academic Advising Center.

For the Bachelor of Arts degree, the foreign language requirement may be fulfilled by completing level-four course-work or by demonstrating the equivalent proficiency in one foreign language.



4. **Bachelor of Science Sample Program**

Freshman Year	Fall	Winter	Spring
BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B		5	4
CHEM 001A or CHEM 01HA, CHEM 001B or CHEM 01HB, CHEM 001C or CHEM 01HC	4	4	4
CHEM 01LA or CHEM 1HLA, CHEM 01LB or CHEM 1HLB, CHEM 01LC or CHEM 1HLC	1	1	1
ENGL 001A, ENGL 001B	4		4
Humanities/Social Sciences			4
MATH 007A or MATH 009A, MATH 007B or MATH 009B	4	4	
NASC 093	2		
Total Units	**15**	**14**	**17**
Sophomore Year	**Fall**	**Winter**	**Spring**
STAT 010			5
BIOL 005C	4		
CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC	4	4	4
Elective		4	
Humanities/Social Sciences		4	
PHYS 002A or PHYS 02HA, PHYS 002B or PHYS 02HB, PHYS 002C or PHYS 02HC	4	4	4
PHYS 02LA or PHYS 02HLA, PHYS 02LB or PHYS 02HLB, PHYS 02LC or PHYS 02HLC	1	1	1
Total Units	**13**	**17**	**14**
Junior Year	**Fall**	**Winter**	**Spring**
BCH 100 or BCH 100H	4		
Humanities/Social Sciences	4	4	4
BIOL 102		4	
BIOL 107A		4	
MCBL 121 or MCBL 131		4	
MCBL 121L or MCBL 131L		3 or 4	
MCBL 125			4
PHIL 009[4]	4		
Major Electives & Depth			7
Total Units	**16**	**15 or 16**	**15**
Senior Year	**Fall**	**Winter**	**Spring**
ENGL 001C		4	
Elective	4		8
Major Electives & Depth	8	8	8
MCBL 197	2	2	
Total Units	**14**	**14**	**16**

Notes:

[1] Some students will take courses in summer session to (i) reduce the unit load during the normal academic year (ii) complete the degree requirements in less than four years or (iii) enable the acquisition of a minor or double major in four years.

[2] No more than 4 units of either MCBL 190 or MCBL 197 can be applied toward the Major Electives unit requirement, unless approved by the Microbiology Steering Committee.

[3] No more than 4 units can be applied toward the Depth Requirements unit requirement, unless approved by the Microbiology Steering Committee.

[4] Students are encouraged to take a class in ethics.

Combined B.S. + M.S. Five-Year Program Requirements

The Undergraduate and Graduate Programs in Microbiology offers a combined B.S. + M.S. program in Microbiology designed to lead to a Bachelor of Science degree as well as a Master of Science degree in five years.

Applicants for this program must intend to enroll in the UCR Microbiology M.S. program, have a high school GPA above 3.6 (when applying to enroll as a freshman or during their freshman year), a 3.5 GPA in major (upper division classes only, minimum of 11 units to be completed by the end of junior year, and a 3.2 GPA overall in their undergraduate program. Interested students who intend to enter the program in their junior year should check with their academic advisor for information on eligibility, admission requirements, and other details.

During the M.S. portion of this program, students must maintain a grade-point average (both in the major and overall) of at least 3.0 for all course work, both cumulatively and for each quarter of enrollment. If the student's GPA falls below 3.0 (for either the major or overall), the student may be dropped from the program.

Master of Science

The Graduate Program in Microbiology offers the M.S. degree in Microbiology.

General university requirements are listed in the Graduate Studies section of this catalog. Students may obtain an M.S. degree in Microbiology through the Plan II (Comprehensive Examination).

Professional Development

All M.S. students participate in the program's seminar (MCBL 250) each quarter of the master's year when offered, and they are also encouraged to take the program's professional development course (PLPA 265).

Plan II (Comprehensive Examination)

Overall Requirements

Students must complete 36 units of approved graduate work in Microbiology. At least 24 of these 36 units must be graduate level courses (200-level). A maximum of 12 units of upper-division (100-level) MCBL courses can be applied toward the 36-unit requirement.

Course Requirements

- Microbiology Graduate Core Courses (MCBL 202, 211, 221)
- 24 units graduate level MCBL courses (200- level) minimum
- Additional 200 and 100 level courses to complete the 36 units

Written Comprehensive Exam

Students take a comprehensive exam created from relevant material from at least 3 of the 200-level microbiology courses, usually the microbiology core courses. Failure to pass the comprehensive examinations after two opportunities constitutes grounds for dismissal from the program.

Normative Time to Degree

15 quarters (B.S. + M.S.)

3 quarters (M.S.)

Graduate Program

The Graduate Program in Microbiology is an interdisciplinary program with participating faculty from the departments of Evolution, Ecology and Organismal Biology, Molecular, Cell, and Systems Biology, Chemical and Environmental Engineering, Chemistry, Entomology, Environmental Sciences, Microbiology and Plant Pathology, and the Division of Biomedical Sciences. Faculty research interests are concentrated in several disciplines in the areas of basic and applied microbiology. These disciplines include the following:

- Microbial Pathogenesis
- Environmental Microbiology and Ecology
- Microbial Evolution, Genomics, and Metagenomics
- Molecular and Cellular Microbiology

Admission

For admission into the graduate program in Microbiology, a student must have a B.A. or B.S. degree from an accredited institution and an academic record that satisfies the minimum admission standards established by the UCR Graduate Division.

Although no specific undergraduate degree specialization is required, applicants should have an adequate background in the physical and biological sciences, including the following or equivalent courses:

CHEM 001A, CHEM 001B, CHEM 001C (General Chemistry), CHEM 008A and 08LA or CHEM 08HA and CHEM 8HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 8HLB, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 8HLC (Organic Chemistry), BCH 110A or BCH 110HA, BCH 110B or BCH 110HB (Biochemistry), MATH 007A or MATH 009A, MATH 007B or MATH 009B (Calculus), STAT 010 or STAT 120A (Statistics), BIOL 102 (Genetics), BIOL 121A/MCBL 121A, BIOL 121L/MCBL 121L (Microbiology), BIOL 107A or BCH 110C (Molecular Biology)

This list is intended to represent the minimum background required for students wishing to pursue a graduate degree in Microbiology. Additional course work and laboratory experience in microbiology, biochemistry or genetics is highly desirable. However, upon the recommendation of the graduate advisory committee, occasionally a student may be admitted into the graduate program with one or more course work deficiencies; such students must satisfy these course work deficiencies usually within the first and no later than within the second year of graduate study.

Curriculum

The program is designed to prepare students for teaching and research careers in colleges and universities, as well as basic and applied research in private, industrial and government laboratories. To attain this goal, a three-tiered set of coursework has been designed: See Master's Degree and Course Work section under Doctoral Degree.

Ph.D. and M.S. students must attend one seminar per week each quarter, when offered, in programs collaborating with Microbiology. The seminar course must be chosen from the following list: MCBL 250, PLPA 250. Other seminar courses may be approved by the graduate advisor. Students are also required to present one seminar during their tenure in the program. The seminar can be either on the student's thesis research or related topics and can be presented in any of several program student seminar series.

Master's Degree

M.S. students must fulfill the requirements for Plan I (Thesis) or Plan II (Comprehensive Examination) of the Graduate Council. All students must complete at least 11 units of 200-level coursework, which can include the microbiology core courses and/or other microbiology courses chosen in consultation with the student advisory committee. Non-microbiology courses can also be used for this 200-level coursework requirement with approval from the student's advisory committee and the graduate advisor. Plan I requires 36 units, of which 24 must be in graduate level courses. Of the 24, a maximum of 12 may be in graduate research for the thesis. The student must also submit and defend an acceptable research thesis. For the Plan II Masters, the Comprehensive Examination option, students must complete 36 units total, of which at least 24 must be in 200-level coursework, which should include the microbiology core courses and/or other microbiology courses chosen in consultation with the student advisory committee. Of the 24 200- level units, a maximum of 6 units may be in graduate research, but no research units are required for this option. The student must also pass a comprehensive exam created from relevant material from at least 3 of the 200-level microbiology courses that the student has already completed, usually the 3 microbiology core courses.

Normative Time to Degree

6 quarters

Doctoral Degree

Ph.D. students must meet all requirements of the Graduate Council. Students satisfactorily complete the core class requirements and a program of courses approved by the student advisory committee. The Ph.D. degree is awarded upon passing the preliminary and qualifying examinations and demonstrating an ability to carry out original research by preparing and submitting an acceptable dissertation.

Students enrolled in the Ph.D. program are expected to become actively engaged in a research project no later than the end of their first year, and research progress is monitored by the student's advisory committee until the student advances to candidacy and a dissertation committee is appointed. The program stresses the importance of innovative and independent laboratory research as the major component of the student's education.

Course Work

The program is designed to prepare students for teaching and research careers in colleges and universities, as well as basic and applied research in private, industrial and government laboratories. To attain this goal, a three-tiered curriculum has been designed whereby students are expected to complete the following:

1. A core sequence of classes in microbiology: MCBL 202 (Microbial Pathogenesis and Physiology), BIOL 221/MCBL 221 (Microbial Genetics), and MCBL 211 (Microbial Ecology)
2. A selection of at least one elective graduate (200-level) course in microbiology or other relevant field(s) chosen in consultation with the student's major professor and the advisory committee in order to develop depth in particular areas of specialization.
3. Research training in specific areas of microbiology (at least 6 units of MCBL 297 or MCBL 299).

Students fulfill their professional development training by enrolling in PLPA 265, a 3 unit course that covers a range of topics including careers in microbiology, CV preparation, skills on giving scientific presentations, strategies for success in the candidacy examination and graduate school, data acquisition, management and ownership, policy and regulation, and intellectual property.

Preliminary Examination

The preliminary examination, consisting of a written, comprehensive examination is based on general microbiology and required material in the student's area of specialization. If a student fails this examination, the advisory committee recommends either additional course work in specific areas of weakness, transfer to a terminal M.S. degree program, or withdrawal from the program. The preliminary examination may only be repeated once and must be passed for the student to continue in the Ph.D. program. The preliminary examination is normally taken in the spring quarter of the second year.

Oral Qualifying Examination

After completion of the preliminary examination, the qualifying committee is established, and the oral qualifying examination is normally taken no later than the eighth quarter (year three) of academic work, not counting summer quarters.

A qualifying committee is nominated by the graduate advisory committee and submitted to the graduate dean for approval. Suggestions of potential members of the qualifying committee may be submitted to the advisory committee by the student and the student's major professor. The qualifying committee is composed of five faculty members: three with expertise in the area of specialization in microbiology, one representing a different area from microbiology, and one outside member. The student's major professor may not serve on the qualifying committee. Prior to the oral qualifying examination, the student submits a written dissertation research proposal to the members of the qualifying committee. The

oral examination covers the student's area of specialization and research field and must be passed for the student to continue in the program. Upon successful completion of the qualifying examination, the student is advanced to candidacy. The qualifying examination may be repeated only once.

The Oral Qualifying Exam can be taken in one of the following modes: In-Person or Hybrid. The student and their advisor will discuss which mode best suits the circumstances, with the advisor making the determination. If the student or one of the other committee members protests the decision, the Program Director will make the final determination. Students taking the exam In-Person are expected to present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the exam on campus in a video enabled room that supports some members physically present and others remotely.

Dissertation and Final Oral Examination

The dissertation committee is nominated by the graduate advisor for approval by the graduate dean (upon successful completion of the qualifying examination) and is composed of the student's major professor and at least two other faculty members suggested by the student and the student's major professor. Before approval of the dissertation, the student is expected to present orally the dissertation research at an announced defense seminar.

The Final Defense can be taken in one of the following modes: In-Person or Hybrid. The student and their advisor will discuss which mode best suits the circumstances with the advisor making the determination. If the student or one of the other committee members protests the decision, the Program Director will make the final determination. Students taking the exam In-Person are expected to present on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the exam on campus in a video enabled room that supports some members physically present and others remotely.

Teaching Requirement

Two quarters of teaching experience is required, which may be satisfied by serving as a teaching assistant in any of the microbiology courses listed.

Foreign Language Requirement

None

Normative Time to Degree

15 quarters

Lower-Division Courses

MCBL 095 Exploring Microbiology 1 Seminar, 1 hour. Prerequisite(s): restricted to major(s) Microbiology. Introduces the role of microbes in our daily lives. Includes food production and biotechnology; research topics in microbiology and career options and preparation; and preparation for postgraduate education. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content or topic changes to a maximum of 2 units.

Upper-Division Courses

MCBL 120 Introduction to Plant Pathology 3 Lecture, 3 hours. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 100H or BCH 110A or BCH 110HA; STAT 004; or equivalent. An introduction to the study of plant diseases. Topics include diseases and disease-causing agents, host-pathogen interaction during disease development, and strategies for disease management. An optional, separate laboratory is offered. Cross-listed with BIOL 120, and PLPA 120. Credit is awarded for one of the following PLPA 120, BIOL 120, MCBL 120, or PLPA 210.

MCBL 120L Introduction to Plant Pathology Laboratory 1 Laboratory, 4 hours. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; BIOL 120, may be taken concurrently or MCBL 120, may be taken concurrently or PLPA 120, may be taken concurrently; STAT 010, may be taken concurrently; BIOL 121/MCBL 121 and BIOL 124/MCBL 124 recommended; or consent of instructor. Covers fundamentals in the use of laboratory instruments and techniques for the detection, isolation, and identification of representative infectious agents that cause disease in plants. Cross-listed with BIOL 120L, and PLPA 120L. Credit is awarded for one of the following PLPA 120L, BIOL 120L, MCBL 120L, or PLPA 210.

MCBL 121 Introductory Microbiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A; BIOL 05LA or BIOL 020; BIOL 005B; BIOL 005C; CHEM 001C or CHEM 01HC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002A, may be taken concurrently or PHYS 02HA, may be taken concurrently; PHYS 02LA, may be taken concurrently or PHYS 02HLA, may be taken concurrently; BCH 100, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; STAT 010; or consent of instructor. An intensive introduction to the fundamental physiology and molecular biology of bacteria and viruses. Covers bacterial and viral molecular genetics, an introduction to microbial pathogenesis, and applications of microbiology in modern societies. Cross-listed with BIOL 121. Credit is awarded for one of the following MCBL 121, BIOL 121, or MCBL 131.

MCBL 121L Microbiology Laboratory 3 Lecture, 1 hour; laboratory, 6 hours. Prerequisite(s): BIOL 121 with a grade of C- or better or MCBL 121 with a grade of C- or better. Laboratory exercises in diagnostic bacteriology, basic virology, and epidemiology. Includes fundamental quantitative and diagnostic microbiological procedures, basic mechanisms of microbial genetic exchange, and a project examining bacterial epidemiology. Cross-listed with BIOL 121L. Credit is awarded for one of the following MCBL 121L, BIOL 121L, or MCBL 131L.

MCBL 122 Food Microbiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 010; or consent of instructor. Covers spoilage and preservation of food; food quality and indicator organisms; the role of microorganisms in the production of dairy goods and fermented beverages; food-borne pathogens and microbiological production of toxins; and classical and modern molecular methods for detection of food microorganisms. Cross-listed with BIOL 122.

MCBL 123 Introduction to Comparative Virology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C, may be taken concurrently or PHYS 02HC, may be taken concurrently; PHYS 02LC, may be taken concurrently or PHYS 02HLC, may be taken concurrently; BCH 100, may be taken concurrently or BCH 100H, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; STAT 004, may be taken concurrently, or equivalent; or consent of instructor. Considers viruses as infectious agents of bacteria, plants, and animals (vertebrates and invertebrates). Compares the major groups of viruses with respect to their biological and biochemical properties, molecular and genetic characteristics, and modes of replication. Cross-listed with BIOL 123, and PLPA 123.

MCBL 124 Medical Microbiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 010; or consent of instructor. An intensive introduction to the fundamental physiology and molecular biology of bacteria and viruses. Covers research strategies for examining microbial pathogenic mechanisms. Cross-listed with BIOL 124.

MCBL 125 Experimental Microbiology 4 Lecture, 1.5 hours; workshop, 1 hour; laboratory, 6 hours. Prerequisite(s): BIOL 102; BIOL 107A; MCBL 121 or MCBL 131; MCBL 121L or MCBL 131L; restricted to class level standing of junior, or senior; restricted to major(s) Microbiology; or consent of instructor. Introduces the process of performing experimental research in a microbiology laboratory. Teaches skills used in formulating hypotheses, designing experiments, performing laboratory experiments, analyzing

data, and preparing and presenting research in written and oral formats. Experimental systems utilized vary from quarter to quarter. Course is repeatable to a maximum of 12 units.

MCBL 126 Microbiomes 3 Lecture, 3 hours. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 010; or consent of instructor. Introduces microbiomes which are the collections of microorganisms that inhabit particular environments or locations and play crucial roles in agriculture, the environment, and human health and disease. Covers fundamental knowledge about microbiomes and experimental strategies to understand and utilize microbiomes to prevent or treat human and plant diseases. Credit is awarded for one of the following MCBL 126 or MCBL 226.

MCBL 127 Microbial Evolution 4 Lecture, 3 hours; workshop, 1 hour. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 010; or consent of instructor. Explores essential roles microbes perform in biogeochemical cycles, directly influencing human, plant, and animal health and disease. Provides important platforms for research and biotechnology. Details the evolutionary history and processes that underlie the critical roles of microbes. Credit is awarded for one of the following MCBL 127 or MCBL 227.

MCBL 128 Field Mycology: Ecology, Evolution, and Diversity of Fungi 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005C; or consent of instructor. An overview of fungal diversity, morphology, ecology, and societal impacts. Topics include fungal diversity, mushroom identification, fungal culturing, molecular methods, and bioinformatics. Explores impacts of fungi on ecosystem functions such as decomposition and symbiosis as well as on society including art, medicine, poisons, and food. Credit is awarded for one of the following MCBL 128 or MCBL 228.

MCBL 129 Host Responses to Viral Pathogens 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; or consent of instructor. Explores host responses to viral infections. Presents content that promotes understanding of how viruses interact with innate immune responses of the mammalian host and how these responses impact disease outcomes for better or worse. Credit is awarded for one of the following MCBL 129 or MCBL 229.

MCBL 131 Introductory Microbiology 2 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; restricted to major(s) Microbiology; or consent of instructor. An intensive introduction to the fundamental cellular and molecular biology of bacteria and viruses. Covers bacterial and viral molecular genetics, regulation, and physiology as well as an introduction to microbial pathogenesis. Restricted to major(s) in Microbiology. Credit is awarded for one of the following MCBL 131, BIOL 121, or MCBL 121.

MCBL 131L Microbiology Laboratory 2 4 Lecture, 1 hour; discussion, 1 hour; laboratory, 6 hours. Prerequisite(s): MCBL 131 with a grade of C- or better; restricted to major(s) Microbiology; or consent of instructor. Laboratory and written exercises in diagnostic bacteriology, basic virology, and epidemiology. Topics include fundamental quantitative and diagnostic microbiological procedures, basic mechanisms of microbial genetic exchange, and a project examining bacterial epidemiology. Restricted to major(s) in Microbiology. Credit is awarded for one of the following MCBL 131L, BIOL 121L, or MCBL 121L.

MCBL 133 Environmental Microbiology 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C; or consent of instructor. Introduction to nonpathogenic microorganisms in the environment. Topics include an introduction to microbial biology and microbial and metabolic genetic diversity; methods; symbiotic interactions; biofilms; and geomicrobiology and biogeochemistry. Explores life in extreme environments and the effects of the physical and chemical environment on microbes. Cross-listed with ENSC 133.

MCBL 139 The Evolution of Conflict and Cooperation: Cheaters and Altruists 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; or consent of instructor. Explores the evolution of selfish and selfless behavior. An analysis of the evolutionary forces that create either conflict or cooperation among genes, microorganisms and their hosts, and kin. Cross-listed with ENTM 139.

MCBL 190 Special Studies 1 to 5 individual study, 3 to 15 hours. Prerequisite(s): permission of instructor and major chairperson. Provides an opportunity to meet specific curricular needs. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. No more than 4 units can be applied toward the degree without permission from the Microbiology Steering Committee.

MCBL 197 Research For Undergraduates 1 to 4 Directed research, 3 to12 hours. Prerequisite(s): consent of instructor; upper-division standing. Individual research in microbiology performed under the guidance of the staff or faculty. Letter grades are assigned to students presenting a research paper; other students are graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

MCBL 198I Individual Internship in Microbiology 1 to 12 Written work, 1 to 12 hours; internship, 2 to 24 hours. Prerequisite(s): BIOL 121 or MCBL 121 or MCBL 131; restricted to class level standing of junior, or senior; and consent of instructor. Provides opportunity for career exploration in microbiology. Includes supervision by a faculty member and an off-campus sponsor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

Graduate Courses

MCBL 202 Microbial Pathogenesis and Physiology 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An in-depth examination of microbes that cause human and animal disease. Explores physiology and pathogenesis of bacterial, fungal, protist, and viral pathogens and their vectors. Includes study of antimicrobial drugs and resistance mechanisms, mode of action for toxins, immunological responses of the host, epidemiological considerations, and development of control practices.

MCBL 206 Gene Silencing 3 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing, BIOL 107A or CBNS 101; or consent of instructor. An in-depth coverage of mechanisms, functions, and applications of RNAi and related gene regulatory pathways guided by small RNAs such as siRNAs and miRNAs in plants and animals. Cross-listed with GEN 206, and CMDB 206.

MCBL 210 Molecular Biology of Human Disease Vectors 3 Lecture, 2 hours; seminar, 1 hour. Prerequisite(s): consent of instructor. Covers the molecular aspects of vectors transmitting most dangerous human diseases. Involves lectures and student presentations about current issues in molecular biology and genomics of vector insects and pathogens they transmit. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with ENTM 210, and CMDB 210.

MCBL 211 Microbial Ecology 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Application of ecological principles to microbial communities. Emphasizes methods for analysis of diversity and community structure and statistical methods relating genetic and biochemical fingerprints to functional properties. Case studies explore applications for agriculture, disease biocontrol, and bioremediation of environmental contaminants.

MCBL 221 Microbial Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102; graduate standing. In-depth coverage of the genetics of microbes. Emphasizes the primary data and the foundation of modern techniques using viruses, archaea, prokaryotes, and eukaryotes. Includes genome sequences and organization, plasmids and other vectors, and mutation and genetic screens. Also covers transposable elements, recombination, and regulation of gene expression, development, and pathogenesis. Cross-listed with BIOL 221, and PLPA 226.

MCBL 226 Microbiomes 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduces microbiomes, which are collections of microorganisms inhabiting particular locations, and which play crucial roles in agriculture, the environment, and human health and disease. Covers fundamental knowledge and experimental strategies to understand and use microbiomes to prevent or treat human

and plant diseases, with the primary focus on human disease. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following MCBL 226 or MCBL 126.

MCBL 227 Microbial Evolution 5 Lecture, 3 hours; discussion, 1 hour; workshop, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Microbes perform essential roles in biogeochemical cycles, directly influence human, plant and animal health and disease, and are important platforms for research and biotechnology. Understanding how all of this is possible requires an understanding the evolutionary history and processes that underlie the critical roles of microbes. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following MCBL 227 or MCBL 127.

MCBL 228 Field Mycology 5 Lecture, 3 hours; laboratory, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Overview of fungal diversity, morphology, ecology, and societal impacts. Topics include fungal diversity, mushroom identification, fungal culturing, molecular methods, and bioinformatics. Explores impacts of fungi on ecosystem functions (such as decomposition and symbiosis) and on society including art, medicine, poisons, and food. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following MCBL 228 or MCBL 128.

MCBL 229 Host Responses to Viral Pathogens 5 Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): graduate standing; and consent of instructor. Overview of how cellular and system-wide responses to viral infections promote or prevent viral diseases. Topics include emerging viruses, innate and adaptive immunity, vaccines, impacts of host genetics and biological sex, and animal models. Approaches the subject matter from the standpoint of developing host-targeted treatments for viral diseases. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following MCBL 229 or MCBL 129.

MCBL 241 Special Topics 2 Lecture, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Oral presentations and intensive small-group discussion of selected topics in each faculty member's area of specialization. Course content emphasizes recent advances in the special topic area and varies accordingly. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with PLPA 241.

MCBL 250 Seminar in Microbiology 1 Seminar, 1 hour. Prerequisite(s): graduate standing. Formal seminars by graduate students, faculty, and invited scholars on selected topics in microbiology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MCBL 262 Seminar in Molecular Biology and Genomics of Disease Vectors 2 Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Seminar series sponsored by the Center for Disease-Vector Research at the Institute for Integrative Genome Biology. Provides an opportunity for graduate students to discuss current issues of molecular biology and genomics of vector insects and pathogens they transmit with guest speakers. Course is repeatable to a maximum of 4 units. Cross-listed with ENTM 262.

MCBL 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Experimental or literature studies on specifically selected topics conducted under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MCBL 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing. Directed research in microbiology. Performed prior to advancement to candidacy and in preparation for thesis or dissertation projects. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MCBL 299 Research For Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing. Original research in the area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Middle East and Islamic Studies

Subject abbreviation: MEIS
College of Humanities, Arts, and Social Sciences

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Committee in Charge

Muhamad Ali, Chair (Religious Studies)
Sahin Acikgoz (Religious Studies)
Reza Aslan (Creative Writing)
Sherine Hafez (Gender & Sexuality Studies)
Erith Jaffe-Berg (Theatre, Film, and Digital Production)
Ruhi Khan (Media and Cultural Studies)
Kyle Khelaf (Comp Lit & Lang)
Laila Lalami (Creative Writing)
Benjamin Liu (Hispanic Studies)
Jeff Sacks (Comp Lit & Lang)
Fariba Zarinebaf (History)
Daryle Williams, Dean, *ex officio*

Majors

The Middle East and Islamic Studies major is designed to provide undergraduate students with a broad understanding of Middle Eastern and Islamic societies and cultures. The program offers an interdisciplinary approach to the study of the Middle East and Islamic traditions with focuses on religion, history, gender and sexuality, literature, art, and popular discourses and practices, which canvass from North Africa to Southeast Asia.

The multidisciplinary nature of the program prepares students for a critical understanding of current issues and further study in a number of academic fields at the graduate level. The major is useful to students planning careers in politics and government, business, education, international and national non-governmental organizations, journalism, and the art, as well as for those who desire a better understanding of the Middle East, Islam, and Islamic cultures.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The major requirements for the B.A. in Middle East and Islamic Studies are as follows (48 units):

1. Language requirement: 4 courses (16 units) Students are required to fulfill the language requirement by taking 4 classes in a language in MEIS (Arabic, Persian, Turkish, Hebrew, Urdu, Malay/ Indonesian) or pass the proficiency requirement by taking a test administered by the department. Currently UCR offers only Arabic, but students can take language classes either abroad (i.e. AUC in Cairo, Bogaziçi University in Istanbul) or in other UC campuses (UCLA, Irvine) upon the approval of MEIS director.
2. Senior Research (4 units): Students must take MEIS 199 or HIST 197 with MEIS content (taken senior year with the prior approval of the instructor and MEIS Director as the MEIS Director should be able to review the content to ensure that it fits the major)
3. Required courses: 3 courses (12 units) (at least one should be taken from area I and one from area II)
   I. Survey courses: AHS 013, ARLC 155/CPLT 155/ MEIS 155/RLST 157, HIST 030, RLST 111, HIST 121, HIST 122, HIST 124
   II. Specialized courses: AHS 125, ANTH169/ GBST 169, GSST 162/ RLST 162, HIST 125, HIST 126
4. Select 4 from the elective courses (16 units of elective courses):

Arabic Literatures and Cultures
ARLC 120, ARLC 151/CPLT 151/MEIS 151, ARLC 152/CPLT 152, ARLC 154/CPLT 154/PHIL 128, ARLC 156/CPLT 156/MEIS 156/RLST 156, ARLC 158/CPLT 158/MEIS 158/RLST 158

Anthropology
ANTH 136/SEAS 136, ANTH 140I, ANTH 188/ GSST 151, ANTH 189/ GSST 168, ANTH 109

Art History
AHS 126

Asian Studies
AST 167/CPLT 167/SEAS 167

Comparative Ancient Civilizations
CPAC 121/CLA 121/POSC 121

Economics
ECON 170E

Gender and Sexuality Studies
ANTH 109/ GSST 109, ANTH 188/ GSST 151,

ANTH 189/ GSST 168, GSST 162/ RLST 162, GSST 169

Global Studies
GBST 191

Hispanic Studies
SPN 193

History
HISE 160, HIST 111, HIST 125, HIST 126, HIST 128

Media and Cultural Studies
MCS 172

Religious Studies
RLST 112, RLST 113, RLST 116, RLST 121, RLST 130, RLST 148, RLST 150, RLST 151, GSST 162/ RLST 162

Theatre, Film and Digital Production
TFDP 177

Minor

The Middle East and Islamic Studies minor offers a broad course of interdisciplinary and theoretically informed study. Students draw upon the range of materials covered in departments including Religious Studies, History, Anthropology, Gender and Sexuality Studies, Creative Writing, Hispanic Studies, Media and Cultural Studies, Theater, Film, and Digital Production, Comparative Literature and Languages, and Art History. Students grain critical knowledge of the texts, histories, practices, and institutions of the Middle East and Islamic traditions in diverse, multilingual, and global contexts.

1. Select 2 from the required courses (8 units)

   AHS 013, AHS 125, ANTH 189/GSST 168, ANTH 169/GBST 169, ARLC 155/CPLT 155/MEIS 155/RLST 157, GSST 162/RLST 162, HIST 030, HIST 121, HIST 122, HIST 124, HIST 125, HIST 126, HIST 128, RLST 111

2. Select 4 from the elective courses (16 units)

   a) **Arabic Literatures**
   ARBC 105

   b) **Arabic Literatures and Cultures**
   ARLC 120, ARLC 151/CPLT 151/MEIS 151, ARLC 152/CPLT 152, ARLC 154/CPLT 154/PHIL 128, ARLC 156/CPLT 156/MEIS 156/RLST 156

   c) **Anthropology**
   ANTH 136/SEAS 136, ANTH 140-I

   d) **Asian Studies**
   AST 167/CPLT 167/SEAS 167

   e) **Comparative Literature**
   CPLT 153

   f) **Gender and Sexuality Studies**
   GSST 151/ANTH 188, GSST 162/RLST 162, GSST 169

   g) **History**
   HISE 117, HISE 160, HISE 112, HISE 116, HISE 118, HIST 128, HIST 137

   h) **Religious Studies**
   RLST 112, RLST 113, RLST 116, RLST 126/HIST 127, RLST 148, RLST 150/SEAS 150, RLST 151, RLST 155

   i) **Theatre, Film and Digital Production**
   TFDP 177

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Lower-Division Courses

MEIS 012 Islam and Feminism 4 Lecture, 3 hours; discussion, 1 hour; written work, 1 hour; term paper, 1 hour. Prerequisite(s): none. Focuses on the intersections between Islam and feminism. Topics include feminist interpretations of the Qur'an, Muslim women's movements and activisms in Islamic and non-Islamic societies, and the complex interactions between the nation-state, religion, gender, and sexuality. Cross-listed with GSST 012, and RLST 011. Credit is awarded for one of the following RLST 011, GSST 012, MEIS 012, GSST 012H, MEIS 012H, or RLST 011H.

MEIS 012H Honors Islam and Feminism 4 Lecture, 3 hours; discussion, 1 hour. Honors course corresponding to MEIS 012. Focuses on the intersections between Islam and feminism. Topics include feminist interpretations of the Qur'an, Muslim women's movements and activisms in Islamic and non-Islamic societies, and the complex interactions between the nation-state, religion, gender, and sexuality. Cross-listed with GSST 012H, and RLST 011H. Credit is awarded for one of the following RLST 011H, GSST 012H, MEIS 012H, GSST 012, MEIS 012, or RLST 011.

Upper-Division Courses

MEIS 110 Gender, Sexuality, and Islam 4 Lecture, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. Focuses on the intersections between gender, sexuality, and religion in Islamicate societies. Discusses the ways in which those formations have been shaped by histories of slavery, imperialism, colonialism, human rights discourses, neoliberalism, contemporary practices of Islamophobia, nationalism, and global LGBTQ activism. Cross-listed with GSST 110, and RLST 105.

MEIS 151 Palestine/Algeria 4 Lecture, 3 hours; screening 6 hours per quarter; extra reading, 24 hours per quarter. Prerequisite(s): upper-division standing or consent of instructor. Considers two distinct and related literary and historical moments: Palestine and Algeria. Topics include the relations between language and context; literature and literary historiography; genre and idiom; violence and the body; and the state and institutional practices of reading. Cross-listed with ARLC 151, and CPLT 151.

MEIS 155 Introduction to Arabic Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to Arabic literature that focuses on language and rhetoric. Considers major issues such as colonialism, secularism, modernity, language, and the state. Utilizes texts from literature, law, and philosophy. Cross-listed with ARLC 155, and CPLT 155.

MEIS 156 Jews and Arabs 4 Lecture, 3 hours; extra reading, 3 hours Prerequisite(s): upper-division standing or consent of instructor. Traces the formation of the shared and divided history of the Jewish and Arab peoples. Focuses on the literary and institutional dimensions of this history, as well as the formation of related areas of study, such as religion, philosophy, literature, and psychoanalysis. Cross-listed with ARLC 156, CPLT 156, and RLST 156.

MEIS 199 Senior Research 4 Consultation, 1 hour; extra reading, 6 hours; term paper, 3 hours. Prerequisite(s): senior standing; consent of Middle East and Islamic Studies Steering Committee chair. Directed original research in topics related to the Middle East, Islamic studies, or Islamic cultures. Administered under the direction of members of the Middle East and Islamic Studies Steering Committee or an approved faculty member.

Graduate Course

MEIS 278 Early Modern Empires in Eurasia 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Explores the history of early modern empires in the Middle East (the Ottomans and Safavids) in a comparative format. Focuses on such issues as Islam and conquest, state formation, confessional empires and toleration, commerce, and culture. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable. Cross-listed with HIST 278.

Middle East and Islamic Studies Designated Emphasis

Subject abbreviation: MEIS
College of Humanities, Arts, and Social Sciences

Muhamad Ali (Religious Studies) Director
(951)827-5111; muhamad.ali@ucr.edu

Committee in Charge

Muhamad Ali, Director (Religious Studies)
Reza Aslan (Creative Writing)
Sherine Hafez (Gender and Sexuality Studies)
Erith Jaffe-Berg (Theatre, Film and Digital Production)
Ruhi Khan (Media and Cultural Studies)
Kyle Khellaf (Comp Lit & For Lang)
Laila Lalami (Creative Writing)
Benjamin Liu (Hispanic Studies)
Fatima Quraishi (Art History)
Jeff Sacks (Comparative Literature)
Fariba Zarinebaf, (History)
Daryle Williams, Dean, ex officio

Designated Emphasis Requirements

The DE in Middle East and Islamic Studies offers two tracks, one with a requirement for proficiency in a relevant language (Arabic, Persian, Turkish, Hebrew, Urdu or another language, with the approval of the chair of the DE), and/or a placement test and a second track without a language requirement.

Students may double count two courses with MEIS content between the DE and the Ph.D.

Track One
Twelve (12) units plus language proficiency (4-6 quarters)

Three (3) courses (12 units) selected from the list below, at least one of which must be outside of the student's Ph.D. department, plus the completion of four (4-6) quarters of language study, as described above.

Track Two
Sixteen (16) units

Three (4) courses (16 units) selected from the list below, at least one of which must be outside of the student's Ph.D. department.

In both tracks, the student is required to take a 2 quarter graduate seminar with the prior approval of faculty member in the relevant discipline. It is understood that the second quarter would be devoted to substantial research and writing.

Applicable Courses

Current Graduate Seminars

AHS 263, CWPA 256, CWPA 257, HIST 254, HIST 277, HIST 278, RLST 200, RLST 249, RLST 252

Petitionable Graduate Seminars

CPLT 215B, CPLT 284, RLST 200A, RLST 201, RLST 202, RLST 203, RLST 204, RLST 205, SPN 251, SPN 279

Current Upper Division Undergraduate Courses

AHS 125, AHS 126; ANTH 136/SEAS 136, ANTH 169/GBST 169, ARLC 120, ARLC 151/CPLT 151, ARLC 152/ CPLT 152, ARLC 154/CPLT 154/ PHIL 154, ARLC 155/RLST 157, ARLC 156/CPLT 156/ RLST 156, ARLC 158/CPLT 158/RLST 158, GSST 151, GSST 162, GSST 168, GSST 169, HIST 121, HIST 122, HIST 124, HIST 125, HIST 126, HIST 128, MCS 172, POSC 133, POSC 152, POSC 156, RLST 111, RLST 113, RLST 116, RLST 149, RLST 150, RLST 151, RLST 155/PHIL 155, SPN 193, TFDP 191J

Molecular, Cell, and Systems Biology

See Cell Biology and Neuroscience

Music

Subject abbreviation: MUS
College of Humanities, Arts, and Social Sciences

Jonathan Ritter, Ph.D. Chair
Department Office, ARTS 149
(951) 827-6097; music.ucr.edu

Professors

Rogério Budasz, Ph.D.
Paulo C. Chagas, Ph.D.
Walter Aaron Clark, Ph.D.
Ian Dicke, Ph.D.
Elizabeth Przybylski, Ph.D.

Professors Emeriti

Byron Adams, D.M.A.
Frederick K. Gable, Ph.D.
Anthony F. Ginter, Ph.D.
René Lysloff Ph.D.
Deborah A. Wong, Ph.D.

Associate Professors

Xóchitl Chávez, Ph.D.
Dana Kaufman, D.M.A.
Jonathan Ritter, Ph.D.
Leonora Saavedra, Ph.D.

Assistant Professors

Bradley Butterworth, M.F.A
Samuel Lamontagne, Ph.D.
Amy Skjerseth, Ph.D.

**

Lecturers

Gary Barnett, Ph.D., *Music Theory*
Ruth Charloff, D.M.A., *Orchestra and Chamber Singers*
Tagumpay de Leon, M.S., *Rondalla Ensemble*
Armando Dueñas, M.A., *Concert Band*
Cynthia Reifler Flores, M.A., *Mariachi Ensemble*
Frances Moore, *Chamber Music*
Emilia Moscosa Borja, D.M.A., *Latin American Music Ensemble*
Terry Nguyen, *Taiko Ensemble*
Joko Sutrisno, B.A., *Javanese Gamelan Ensemble*
Joshua Welchez, M.M., *Jazz Ensemble*

Vocal and Instrumental Instruction

Christine Araoka, M.A., *Jazz Piano*
Ralph Cato, D.M.A., *Voice*
Lisa Cherry, M.M., *French Horn*
David W. Christensen, M.M., *Organ and Carillon*
Lisa Geering Tomoff, B.A., *Oboe*
Hermann Hudde, Ph.D. *Classical Guitar*
Elizabeth Low-Atwater, M.M., *Bassoon*
Ana Maldonado, *Violoncello*
Ray McNamara, *Percussion*
Todd Moellenberg, D.M.A., *Classical Piano*
Frances C. Moore, M.A., *Violin and Viola*
David Pittel, *Classical Trumpet*
Steven Ragsdale, M.M., *Saxophone*
Henry Rodriguez, B.A., *Drum Set*
Robert L. Scarano, B.A. *Jazz Guitar*
Leslie Schroerlucke, M.M., *Clarinet*
Aaron Shaw, *Scottish Bagpipe*
Scott Sutherland, M.M., *Tuba*
John Urban, M.A., *Jazz and Classical Acoustic Bass*
Martin Torres, M.A., *Electric Bass*
Celia Chan Valerio, *Harp*
Joshua Welchez, *M.M., Jazz Trumpet*
Kirsten Ashley Wiest, D.M.A. *Voice*

Majors

The Music Department offers undergraduate majors leading to the B.A. in Music and the B.A. in Music and Culture.

Scholarships

Students have access to student assistantships, work-study, Gluck Fellowships, and scholarships. For further information or a department tour, call the Music Department, (951) 827-7059.

Performance

Throughout each academic year the Department of Music and Cultural Events sponsors more than 50 formal and informal concerts and recitals by campus ensembles, students, members of the performance faculty, and distinguished visiting artists. Most of the Music Department concerts are open to the public.

Facilities

The department's facilities include practice rooms equipped with Yamaha pianos, a Piano Lab, a Chamber Music Studio, and a large lecture/rehearsal hall, as well as smaller classrooms and practice rooms. Practice rooms are available to Music Majors and to students enrolled in an ensemble or in a course with a Voice & Instrument instructor. Most Practice rooms are open to music students on a first-come/first-served basis. For other Practice rooms, students can submit a request for a key to CHASS facilities via the website: chassintranet.ucr.edu/kims. The student's undergraduate advisor must approve the request.

Lockers for small- and medium-size instruments are available to students inside Arts 068 (Instrument Storage Room). A limited number of lockers next to the Piano Lab are reserved for large instruments. The department owns significant collection of early-music instruments, including a number of early keyboard instruments, as well as instruments for use in traditional chamber, orchestral, and wind ensembles. The department also owns the instruments for several Asian ensembles, i.e., Javanese gamelan, Japanese taiko, Philippine rondalla, North Indiana tabla, and Korean drums, as well as for two Latin American ensembles, Andean and Mexican folkloric music. The Experimental Acoustic Research Studio (EARS) supports the composition of electronic music and is housed at a location near campus. The department is also home to the Center for Iberian and Latin American Music, which sponsors concerts and lectures in addition to maintaining a website and scholarly journal.

The **UCR library** holds strong music-research collections. Approximately 36,000 books about music may be found in the Rivera Library, along with an authoritative collection of reference works, journal back-files and microforms. The Rivera library also provides listening equipment, computers, and houses collections of more than 12,500 records and CDs, a growing collection of music DVDs, and more than 38,000 music scores. The UCR Library also provides online access to music, recordings, videos, books, and journals for use in music research. Special Collections, on the 4th floor of the Rivera Library, holds numerous 18th- and 19th-century scores of major German and Austrian composers, as well as the Oswald

Jonas and Joaquin Nin-Culmell archives. The UCR library homepage, library.ucr.edu, provides access to the UC system's online catalog, as well as links to a wide variety of electronic resources.

Music Major

The Department of Music offers a Bachelor of Arts in music within the context of a liberal arts curriculum. Students acquire practical knowledge of music performance and composition through individual study as well as participation in one or more of the department's several ensembles. Development of the student's vocal and/or instrumental technique is enhanced by the study of musicianship, theory, and history, which impart a deeper understanding of the structure of music and the cultural forces that shape it.

Time to degree

Time to degree is four years. Freshman year: preparatory courses MUS001 and MUS010. Sophomore year: lower division requirements; piano proficiency. Junior year: upper division requirements, track requirements, and electives. Senior year: upper division track requirements, and electives.

Students declare a Major in Music in the General or Music Industry Tracks by the end of their freshman year. Students that wish to declare a Major in Music within the Performance Track must first pass an audition. Students that wish to declare a Major in Music within the Composition Track must first take MUS 037 and pass an audition.

The Major offers four curricular tracks, among which students may choose a concentration:

1. Music - General
2. Music - Composition
3. Music - Performance
4. Music - Music Industry

Music and Culture Major

The Music and Culture major offers a predominantly scholarly and critical approach to music as culture from the perspective of research, criticism, and interpretation, with an emphasis on historical and ethnographic approaches. It is oriented primarily toward understanding music as a culturally expressive form. Courses in music and/or dance performance are required but are positioned more broadly within the major as a means to explore interrelationships between music and other forms of performance.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

Music Major

The major requirements for the B.A. degree in Music for the general, performance, and composition tracks are as follows:

1. Participation in a major ensemble each quarter (9-18 units): MUS 160, MUS 161, MUS 162, MUS 163, MUS 164, MUS 165, MUS 166(E-Z), MUS 168, MUS 169, MUS 170, MUS 174, MUS 175A, MUS 175B, MUS 176, MUS 177, MUS 179
2. Lower-division requirements (1-25 units)
   a) MUS 030A, MUS 030B, MUS 030C (12 units or proficiency)
   b) MUS 031A, MUS 031B, MUS 031C (12 units or proficiency)
   c) MUS 032B (2 units and/or piano proficiency exam)
3. Upper-division requirements (20-32 units)
   a) MUS 112A, MUS 112B, MUS 112C (12 units)
   b) MUS 130A (4 units)
   c) MUS 131A, MUS 131B, MUS 131C (12 units or proficiency)
   d) MUS 138 (4 units)
4. Upper-division track requirements: choose from one of the following tracks
   a) Music – General (32 units) 32 units from the following:
      (1) MUS 113, MUS 114, MUS 115, MUS 116, MUS 117, MUS 118, MUS 119, MUS 120, MUS 121, MUS 122, MUS 123, MUS 124, MUS 125, MUS 126, MUS 127, MUS 128, MUS 130B, MUS 134, MUS 135, MUS 136, MUS 137, MUS 139, MUS 140, MUS 142, MUS 145A, MUS 145B, MUS 146, MUS 147, MUS 148, MUS 150A, MUS 150B, MUS 150C, MUS 150D, MUS 151, MUS 152, MUS 153, MUS 154 (EZ), MUS 155 (E-Z), MUS 184, MUS 191 (E-Z) (no more than 4 units)
   b) Music – Composition (A successful portfolio review and completion of MUS 037 with a C or higher—or instructors' consent—by the end of sophomore year is required to enter the track) (28 units)
      (1) 4 units from the following: MUS 136, MUS 147, MUS 157
      (2) MUS 134, MUS 145A (8 units)
      (3) MUS 149(16 units)
   c) Music – Performance (A successful audition by the end of the sophomore year is required for the Performance Track) (30 units)
      (1) 12 units from the following: MUS 180 (E-Z), MUS 181 (E-Z)
      (2) 16 units from the following: MUS 113, MUS 114, MUS 115, MUS 116, MUS 117, MUS 118, MUS 119, MUS 120, MUS 121, MUS 122, MUS 123, MUS 124, MUS 125, MUS 126, MUS 127, MUS 128, MUS 130B, MUS 134, MUS 135, MUS 136, MUS 137, MUS 139, MUS 140, MUS 142, MUS 145A, MUS 145B, MUS 146, MUS 150A, MUS 150B, MUS 150C, MUS 150D, MUS 151, MUS 152, MUS 153, MUS 154 (E-Z), MUS 155 (E-Z), MUS 184, MUS 187, MUS 191 (E-Z).
      (3) MUS 167 (2 units)

Music Industry

The major requirements for the B.A. degree in Music for Music Industry track are as follows (a successful audition by the end of the freshman year is required for the Music Industry Track): are as follows:

(1) Lower-division requirements (30-49 units)
   a) MUS 030A, MUS 030B, MUS 030C, MUS 031A, MUS 031B, MUS 031 C (24 units or proficiency)
   b) MUS 032B (2 units or proficiency)
   c) 3 units from the following: MUS 162, MUS 163
   d) 3 units from the following: MUS 160, MUS 161, MUS 164, MUS 165, MUS 166 (E-Z), MUS 168, MUS 169, MUS 170/ SEAS 170/AST 170, MUS 174, MUS 175A, MUS 175B, MUS 177, MUS 178, MUS 179
   e) 4-8 units from the following: MUS 007, MUS 008, MUS 011, MUS 014/ ETST 014, MUS 015/LNST 015, MUS 026/MCS 026
   f) 4-12 units from the following: MUS 044, MUS 037, MUS 009, MUS 023
   g) 4-14 units from the following: BUS 020, ECON 003, STAT 008

(2) Upper-division requirements (A successful portfolio review and completion of lower-division courses is required by the end of sophomore year to advance to upper-division) (27-46 units)
   a) MUS 145A (4 units)
   b) MUS 185 or MUS 185S (4 units)
   c) 3-6 units of the following: MUS 160, MUS 161, MUS 162, MUS 163, MUS 164, MUS 165, MUS 166 (E-Z), MUS 168, MUS 169, MUS 170, MUS 174, MUS 175A, MUS 175B, MUS 176, MUS 177, MUS 178, MUS 179, MUS 180 (E-Z), MUS 181 (E-Z)
   d) 12-20 units of the following: MUS 112A, MUS 112B, MUS 112C, MUS 118, MUS 120, MUS 124/AST 124, MUS 125, MUS 126/ANTH 177/GSST 126, MUS 130A, MUS 136, MUS 138, MUS 140/ HISA 139, MUS 140L, MUS 146, MUS 155 (E-Z)/DNCE 155(E-Z), MUS 184
   e) 4-12 units of the following: MUS 145B, MUS 198I, BUS 103, BUS 107

Examinations and Auditions

No audition is required to declare a major in music. For students wishing to pursue a specialized track (composition, performance, or music industry), see requirements below.

The ability to play simple piano music is required of all majors. Students lacking keyboard proficiency when the major is declared must enroll in MUS 032A and/ or MUS 032B to prepare them for the proficiency examination, administered by the Department's piano instructor. Alternatively, students with previous keyboard experience can request to take the proficiency examination instead of enrolling in MUS 032A/B. It is recommended that this examination must be passed by the end of the junior year. Consult the department for examination requirements.

Students that wish to declare a Major in Music within the Performance or the Music

Industry track must complete an audition prior to the declaration of the major. Consult the department for audition requirements and scheduling.

Students that wish to declare a Major in Music within the Composition Track must 1) complete MUS 037 with a grade C or higher, and 2) present three diverse works (at least one of which must be realized through music notation) to the composition faculty during a brief audition at the end of the sophomore year.

If entering as a Junior, transfer Performance and Composition students will need to schedule an audition upon arrival to campus. The MUS 037 prerequisite for Composition students can be waived at the faculty's discretion.

MUS 031A, MUS 031B, and MUS 031C are taken until proficiency for admission to MUS 131A is achieved. The completion of MUS 131A, MUS 131B, and MUS 131C is required for graduation.

All students are strongly encouraged to participate in an ensemble each quarter. All students intending to participate in an ensemble course should contact the instructor to inquire about audition reuqirements during registration. Not all ensembles require an audition.

Juries

Juries are mandatory for Music juniors and seniors enrolled in the Performance Track. Students must play for two of them, on two different quarters, within each academic year. Students do not play for juries the quarter in which they perform a senior recital. Juries are optional for non-Music Majors, and Music Majors who are not in the Performance Track but who are nevertheless taking Voice & Instrument lessons at the Department. Please note that an instructor may require that a student participate play for juries even if they are not in the Performance Track.

Fees

An additional course fee will be charged at the time of registration for MUS 080 (E-Z), MUS 081 (E-Z) (half-hour private lessons in voice or instrument), MUS 180 (E-Z), and MUS 181 (E-Z) (one-hour private lessons in voice or instrument). A limited number of scholarships will be made available.

Music and Culture Major

The major requirements for the B.A. degree in Music and Culture are as follows:

1. Students participate in a major ensemble each quarter. Students may enroll in DNCE 067A through DNCE 075B instead of, or in addition to, any of the music ensemble courses (6-12 units).
2. Lower-division requirements (16 units)
   a) MUS 012
   b) MUS 006
   c) MUS 008
   d) MUS 014
3. Upper-division requirements (36 units)
   a) Music courses (24 units)
      (1) Western Music History (4 units): MUS 112A, MUS 112B, MUS 112C, MUS 114, MUS 117, MUS 136, MUS 155, MUS 191 (E-Z)
      (2) Ethnomusicology (20 units): MUS 113, MUS 116, MUS 117, MUS 118, MUS 119, MUS 120, MUS 122, MUS 123, MUS 124/AST 124, MUS 125, MUS 126/ANTH 177/GSST 126, MUS 127/ ANTH 176/AST 127/DNCE 127/ETST 172, MUS 140/HISA 139, MUS 146, MUS 184
   b) Other upper-division courses (12 units)
      (1) Dance History (4–8 units): ANTH 130, DNCE 171 (E-Z), DNCE 172 (E-Z), DNCE 173 (E-Z)
      (2) Anthropology or Sociology (4–8 units)
      (3) English or Media and Cultural Studies (4–8 units)
      (4) Other courses in the Social Sciences, Humanities, or Arts could count towards these units if the students petitions and an advisor's permission is granted.

Minor

The minor in Music is designed for students who wish to continue their musical studies while pursuing another major. Within the required 24 upper-division units, the minor provides basic skills in music theory and first-level studies in music history and literature while still offering modest flexibility to pursue individual interests.

1. Lower-division preparation: (12-20 units)
   a) MUS 001, MUS 010 or equivalent
   b) MUS 030A, MUS 030B, MUS 030C
2. Upper-division requirements (24 units)
   a) Eight (8) units from MUS 112A, MUS 112B, MUS 112C
   b) Twelve (12) units selected from: MUS 113, MUS 114, MUS 115, MUS 116, MUS 117, MUS 118, MUS 119, MUS 120, MUS 121, MUS 122, MUS 123, MUS 124, MUS 125, MUS 126, MUS 127, MUS 128, MUS 130A, MUS 130B, MUS 134, MUS 135, MUS 136, MUS 137, MUS 138, MUS 139, MUS 140, MUS 142, MUS 145A, MUS 145B, MUS 146, MUS 147, MUS 148, MUS 150A, MUS 150B, MUS 150C, MUS 150D, MUS 151, MUS 152, MUS 153, MUS 154 (E-Z), MUS 155 (E-Z), MUS 180 (E-Z), MUS 181 (E-Z) (no more than 4 units), MUS 184, MUS 185, MUS 191 (E-Z)
   c) Four (4) additional units in ensemble performance: MUS 160, MUS 161, MUS 162, MUS 163, MUS 164, MUS 165, MUS 166, MUS 168, MUS 169, MUS 170, MUS 171, MUS 172, MUS 174, MUS 175A, MUS 175B, MUS 176, MUS 177, MUS 178, MUS 179, MUS 182, MUS 183

As a freshman or sophomore, the student should complete MUS 030A, MUS 030B, MUS 030C (Harmony). This is a prerequisite for all later studies in the minor. Harmony has a prerequisite of MUS 001 (Introduction to Basic Musical Concepts) and MUS 010 or the equivalent.

Two required courses from MUS 112A, MUS 112B, MUS 112C should be completed following MUS 030A, MUS 030B, MUS 030C and not later than the junior year.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Graduate Program

The Department of Music offers the M.A. and Ph.D. degrees in Music with a specialization in three areas: composition, ethnomusicology, and musicology. Students are encouraged to view music in the broad context of culture: communication between the intradisciplinary areas is built into the program, and courses outside the department are either encouraged or required in order to develop an interdisciplinary outlook.

Admission

Applicants may apply for a terminal M.A. degree. Applicants intending to pursue a Ph.D. as their final degree objective should apply directly to the Ph.D. program. Applicants with a B.A. should follow the requirements for the M.A. for the first six quarters.

Applicants are admitted into the graduate program in the fall quarter only. All applicants must submit an example of their writing.

Composers must also submit three to five original compositions and corresponding recordings (MIDI mockups are acceptable). At least two pieces should be realized with notation software, while others may take the form of electronic music. In addition, composers are encouraged to submit music software that they have authored or other digital audio related activity (papers, sound installations, etc.).

Graduate composition applicants may come from an untraditional background and not possess previous music degrees. However, applicants must have earned an undergraduate degree to be considered for admission.

Musicology applicants must have an M.A. or undergraduate degree in music, including piano proficiency and musicianship (ear training).

Ethnomusicology applicants must have a background in music or anthropology. Evidence of superior intellectual ability in another field combined with some demonstrable expertise in any musical tradition is also viewed favorably.

Entering graduate students in composition and musicology must take an advisory examination. In musicology, admission to full graduate status is contingent upon the removal of any deficiencies in undergraduate preparation as shown by this advisory examination. In digital composition, deficiencies in undergraduate preparation must be completed by the time of

the Comprehensive Examination.

In composition, deficiencies in undergraduate preparation must be completed by the time of the Comprehensive Examination.

Professional Development Requirements

The Professional Development courses (MUS 301 and MUS 400, taken jointly) satisfy the Professional Development requirement for both the MA and PhD degrees. Topics discussed typically include: course design; pedagogy; flipped classrooms; designing examinations; facilitating discussion; gender and race issues in the classroom; interviewing, writing, and oral presentation skills; publishing; the academic job market and the job application process; and nonacademic careers.

Master's Degree

The M.A. Degree

The Department of Music offers the M.A. degree in Music under Plan II (Comprehensive Examination).

Requirements

In addition to the coursework indicated below, all students must meet the following requirements.

1. **Comprehensive examination**
   All students must pass a written andoral comprehensive examination during their sixth quarter, testing knowledge over a broad spectrum of their field of study.
   a. The ethnomusicology comprehensive exam consists of the following: 1) A portfolio of the student's work from the first 5 quarters in the program, prepared under the supervision of the student's chosen advisor. This portfolio should include an introduction, CV, representative work from seminars or other courses, and one revised and augmented seminar paper of article length directed at publication. To prepare the portfolio, students may take up to one quarter of MUS 291 (Individual Study in Coordinated Areas, 4 credits) with their advisor, typically in the winter quarter of their second year. The complete portfolio should be submitted to the committee at the beginning of spring quarter (~April 1st), and the oral exam is scheduled for later that month. 2) A one-hour oral exam with a committee of three faculty, chaired by the student's advisor. The portfolio and revised seminar paper are the subject of the oral exam. The oral exam may be conducted in-person or hybrid, at the discretion of the student's advisor.
   b. The musicology comprehensive exam consists of the following: 1) a portfolio of the student's work from the first 5 quarters in the program, along with a brief introduction, prepared under the supervision of the student's advisor; and 2) a one-hour written exam covering Western art music theory and history. For students interested in continuing to the PhD, the portfolio should also include an additional revised and augmented seminar paper of 8,000-10,000 words, directed toward publication, prepared under the supervision of the student's advisor. The portfolio and results of the written exam will be reviewed by a committee of three faculty to determine the outcome of the comprehensive exam.
   c. The composition comprehensive exam consists of the following: 1) a portfolio of the student's work (containing at least three pieces) from the first 5 quarters in the program; and 2) a composition test comprised of several applied exercises. The portfolio and results of the composition test will be reviewed by a committee of three faculty to determine the outcome of the comprehensive exam.

   The comprehensive examination can be passed at the M.A. or at the Ph.D. level. Passing the exam at the Ph.D. level is a requirement for students intending to pursue a Ph.D. Failure to pass the comprehensive examinations after two opportunities constitutes grounds for dismissal from the program.
2. **Foreign Language Requirement**
   Students must demonstrate a reading knowledge of a foreign language, of use in scholarship within their discipline or chosen to support their research and creative interests, with the approval of the department. The requirement can be satisfied either by examination or by enrolling in 4 quarters of a language course with a grade of "B" or better.
3. **Coursework**
   Each area requires a minimum of 48 units of graduate (200 series) or upper-division undergraduate courses (100 series), these may include up to 8 units of MUS 299 (Thesis Preparation).Twenty four units must be graduate level. None may be MUS 291, MUS 301 or MUS 400.

   Performance courses (MUS 160-181) do not count toward the degree, with the exception of 4 units in world music ensembles required of ethnomusicology students (see requirements below). The courses comprising the remaining required units are disposed differently in each of the three areas as specified below.

   1. **Composition**
      a) Core requirements
         MUS 200, MUS 201, MUS 206 or MUS 207B, MUS 256, MUS 258 (repeatable), MUS 265, MUS 293 (6 units), MUS 301, MUS 400
      b) Three of the following repeatable courses:
         MUS 232, MUS 249, MUS 251, MUS 257, MUS 259, MUS 264
   2. **Ethnomusicology**
      a) Core courses
         MUS 200, MUS 207A, MUS 207B, MUS 207C, MUS 255, MUS 301, MUS 400
      b) At least two quarters of the following courses:
         MUS 270, MUS 271
      c) Two of the following courses:
         MUS 113, MUS 117, MUS 118, MUS 119, MUS 120, MUS 122, MUS 123, MUS 124, MUS 126, MUS 127, MUS 128, MUS 140, MUS 146, MUS 184
      d) One graduate seminar in musicology or composition/theory:
         MUS 201, MUS 206, MUS 232, MUS 249, MUS 251, MUS 252, MUS 256, MUS 257, MUS 258, MUS 259, MUS 261, MUS 262, MUS 263, MUS 264, MUS 265, MUS 266, MUS 293
      e) Two graduate courses outside the department; may use directed studies (MUS 290) for one.
      f) Four units in one of the following ensembles:
         MUS 168, MUS 169, MUS 170, MUS 174, MUS 175A, MUS 175B, MUS 176, MUS 177, MUS 178, MUS 179
   3. **Musicology**
      a) Core requirements
         MUS 200, MUS 201, MUS 206, MUS 207B, MUS 301, MUS 400
      b) Six courses in the 260s series:
         MUS 261, MUS 262, MUS 263
      c) Two graduate courses outside the Music Department; may use directed studies (MUS 290)
      d) Two of the following courses:
         MUS 118, MUS 155 E-Z, MUS 126, MUS 153, MUS 255, MUS 265, MUS 255, MUS 259, MUS 270

Normative time to degree

6 quarters

Doctoral Program

The Department of Music offers the Ph.D. degree in Music. Students are invited by the faculty to continue toward candidacy for the Ph.D. degree on the basis of performance in courses and seminars, the quality of their portfolios, passing the comprehensive examination at the Ph.D. level, satisfactory completion of the M.A. requirements, and the recommendation of the faculty in their track (digital composition, musicology or ethnomusicology), in consultation with the graduate advisor.

Students with an M.A. degree from other universities are eligible for admission. The process of admission is the same as for students with a B.A.

Requirements

1. **Foreign language requirement**
   Musicology and ethnomusicology students must demonstrate a reading knowledge of a second foreign language, of use in scholarship within their discipline or chosen to support their research and creative interests. Students in these concentrations with an M.A. from other universities, who did not have to meet a foreign language requirement, must demonstrate a reading knowledge of two foreign languages during their residency at UCR. Digital composition

students are required to demonstrate a reading knowledge of one foreign language.

2. **Coursework**
   Students continuing toward the Ph.D. must take 36 additional units earned in seminars and in MUS 291 and MUS 299 studies geared toward preparation for the qualifying examinations. None may be MUS 301 or MUS 400.

   Students entering with an M.A. from another institution must take a minimum of 48 units earned in seminars and directed studies (MUS 290). These must include the following required courses, although waiver may be granted for specific courses on an individual basis, depending on the student's prior graduate training and pending faculty approval. Students are encouraged to take additional seminars and MUS 291 and MUS 299 courses geared toward preparation for the qualifying examinations.

   Ethnomusicology students must meet the course requirements of the M.A. as stated above.

   Digital composition students are required to take:

   a) Core requirements

      MUS 200, MUS 201, MUS 206 or MUS 207B, MUS 256, MUS 258 (repeatable), MUS 265, MUS 293 (6 units), MUS 301, MUS 400

   b) Two of the following repeatable courses:

      MUS 232, MUS 249, MUS 251, MUS 257, MUS 259, MUS 264

   Musicology students are required to take:

   a) Core requirements

      MUS 200, MUS 201, MUS 206, MUS 207B or MUS 255, MUS 301, MUS 400

   b) Five courses in the 260s series:

      MUS 261, MUS 262, MUS 263

3. **Qualifying examinations**
   Students must take the qualifying examinations, both written and oral, supervised by a faculty committee as stipulated in the regulations of the Graduate Division. The qualifying examinations concentrate on testing advanced skills and knowledge of specialized fields. Digital composition students are also expected to pass a test containing ear-training, keyboard, and basic compositional skills. Qualifying examinations are normally taken in the ninth quarter for students entering with a B.A., and in the sixth quarter, for students entering with an M.A.

   The qualifying exam and final dissertation oral examination will occur in an in-person format by default, with the student and all committee members physically present in the exam room. If one or more participants is unable to attend an in-person exam/defense within the appropriate time frame, some or all participants may attend remotely via video conferencing software. The decision to adopt a remote or hybrid modality should be mutually agreed upon by the committee chair and the student, and the student must notify the Graduate Advisor of the change prior to the exam/defense. If the participants cannot reach a consensus regarding the modality, the Graduate Advisor will arbitrate the modality.

4. **Dissertation prospectus**
   Students must write a dissertation prospectus as part of the written qualifying examinations.

Advancement to candidacy for the Ph.D. degree
Students advance to candidacy for the Ph.D. degree once they have passed all coursework and the written and oral qualifying examinations.

Dissertation and final oral examination
A dissertation to be presented as prescribed by the Graduate Council is prepared under the direction of the candidate's dissertation committee. After completion of the dissertation, the candidate may be examined in its defense by the dissertation committee, following the guidelines established above for exam modality (in-person, hybrid, or remote).

Normative time to degree
For students in Digital Composition and Musicology: 15 quarters for students entering with a B.A. degree; 12 quarters for students entering with an M.A. degree. For students in Ethnomusicology: 21 quarters for students entering with a B.A. degree; 15 quarters for students entering with an M.A. degree.

The descriptions of many courses listed below carry the phrase "or consent of instructor." This is meant to encourage musically qualified students who are not majors to participate in the courses and activities of the department. Any nonmajor having interest in a specific course should confer with the instructor about the qualifications for enrollment.

Lower-Division Courses

MUS 001 Basic Musical Concepts 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers the fundamentals of music including notations, rhythm, major and minor scales, intervals, tonality, and triads. Includes ear training, sight singing, and elementary analysis. Musical literacy not required. To be taken during freshman year in preparation for the Music Major.

MUS 002 Introduction to Western Music 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): none. A survey of the major styles and genres of Western music. Emphasis on creative and analytical listening without the use of musical notation. Designed for the general student with an interest in music and cultural practice. No previous musical background required.

MUS 003 Introduction to Opera 4 Seminar, 3 hours; assigned listening, 3 hours. Prerequisite(s): none. Explores social, political, gender-related, and moral issues represented in 10 major operas between the seventeenth and twentieth centuries. Introduces dramatic and musical structures of opera, value of performance, and operatic conventions shared by composers, singers, and audience.

MUS 005 Women in Music 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): none. A survey course designed primarily for nonmajors. Examines representative works by women composers from antiquity to the present.

MUS 006 Introduction to World Music 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A survey of people, identity, and music making. Includes listening to music from many cultural contexts. Also covers a variety of scholarly topics in world music. Cross-listed with ANTH 006.

MUS 007 Music in Movies and Tv 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): none. An exploration of popular film and TV soundtrack music, emphasizing drama and musical style. Scene study features such films as The Matrix, Casablanca, The X-Files, and Altered States. Cross-listed with MCS 009.

MUS 008 Popular Music Cultures of the United States 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): none. Explores the so-called popular musics and music cultures of the United States and the social history of these cultures to provide students with a sonic understanding of these extremely fractured, ever reconstituted "United States."

MUS 009 Introduction to Digital Music 4 Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): none. Teaches basic theory and practical skills for understanding digital audio, recording, editing, and processing sound. Includes work with audio and MIDI sequencers with the goal of writing musical compositions with computer notation programs.

MUS 010 Advanced Fundamentals 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 001; or a passing score on a diagnostic examination and consent of instructor. Advanced study of musical notation, meter and rhythm. Includes major and minor scales, keys, tonal functions, compound meter, and mixed meter. Also provides training in sight singing, interval recognition, and chord quality identification for triads and seventh chords. To be taken during freshman year in preparation for the Music Major.

MUS 012 Introduction to Music and Culture 4 Lecture, 3 hours; extra reading, 2 hours; activity, 1 hour; listening activity, 1 hour. Prerequisite(s): None. Introduces methods and develops skills for understanding music in society. Includes an overview of music's social roles, including personal identity, nationalism, and political movements. Students listen to music of multiple genres and geocultural areas, participate in activities and workshops, and develop writing skills to describe and analyze musical practices.

MUS 014 Popular Musics of the World 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to issues surrounding popular and urban musics of the world focusing on three major geocultural areas: Africa, Asia, and the Americas. Emphasizes the relationship between mass-mediated music and issues

of cultural hegemony, resistance, and subversion. Analyzes the cultural impact of media technology on music performance and reception. Cross-listed with ETST 014, and URST 014.

MUS 015 Latin American Folk and Popular Styles 4 Lecture, 2 hours; discussion, 1 hour. assigned listening, 3 hours. Prerequisite(s): none. Introduction to the vast array of folk and popular styles of music in Latin America, with an emphasis on cultural and ethnic interaction and exchange in the context of Latin American history, politics, and society. Cross-listed with LNST 015.

MUS 016 Latin American Classical Heritage 4 Lecture, 2 hours, discussion, 1 hour. assigned listening, 3 hours. Prerequisite(s): none. Survey of the rich heritage of Latin American classical music from Renaissance sacred polyphony to contemporary styles. Emphasis on the gradual emergence of Latin American music from European domination and the establishment of distinctive national traditions in the post-colonial era. Cross-listed with LNST 016.

MUS 017 Music of Mexico 4 Lecture, 3 hours, discussion, 1 hour; assigned listening, 1 hour. Prerequisite(s): musical training and knowledge of Spanish is useful, but not required. Covers music from 1521 to the present day. Explores the rich musical tradition of Mexico, as well as the relationship between its art and popular music. Cross-listed with LNST 017.

MUS 018 Music of Spain 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): none. A survey of Spanish music from the Middle Ages to the present. Covers regional folklore and popular styles (especially flamenco) as well as developments in classical music through the major style periods. Examines music in its historical and cultural context. Knowledge of Spanish and music not required.

MUS 019 Music of Brazil 4 Lecture, 3 hours; discussion, 1 hour; extra reading,1 hour; activity, 1 hour; listening, 1 hour. Prerequisite(s): none. An exploration of Brazilian music from nineteenth to early twentieth-first centuries with an emphasis on traditional and popular practices and styles. Discusses the music of different regions and periods in their social, political, ethnic, and aesthetic contexts. Credit is awarded for only one of MUS 019 or MUS 113.

MUS 020 Music of Scotland 4 Seminar, 3 hours; term paper, 1 hour; assigned listening, 2 hours. Examines the rich heritage of Scottish music from the Middle Ages to the modern day, including folk, popular, and classical traditions. Emphasis is on the music of the Scottish highlands and the bagpipe. Explores the role of music during war and peace within the context of Scottish history.

MUS 021 Canntaireachd: Scottish Classical Music 4 Lecture, 3 hours; term paper, 1 hour per quarter; practice, 3 hours. Prerequisite(s): none. Examines the Scottish classical music called Canntaireachd. In-depth study of the music, its leading performers and composers, within the context of Scottish history and culture. Special emphasis on the singing of the music as soloists and as a choir.

MUS 023 Audio Recording and Production 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): none. Introduces the fundamentals of audio recording. Includes basic design and uses of a recording studio, digital audio workstations, and microphones, as well as recording, processing, and mixing techniques. Course is repeatable to a maximum of 8 units.

MUS 024 Global Hip Hop: Rap Cultures Around the World 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the history and contemporary practice of hip hop music and culture around the world. Emphasizes the role of hip hop in the formation of identity including race, ethnicity, gender, and sexuality, as well as the politics of language, localization and globalization, and political activism.

MUS 026 Art of the Synthesizer 4 Lecture, 3 hours; discussion, 1 hour. Explores the history of synthesizers through the stories of pioneering electronic musicians. Introduces the concepts of modular synthesis through applied patch designs with virtual software. Cross-listed with MCS 026.

MUS 030A Harmony 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 010; or a passing score on a diagnostic examination. MUS majors are required to concurrently enroll in MUS 031A; or consent of instructor. First of a three-quarter long study of harmony. Includes diatonic primary and secondary chords in root position and inversions, four-part vocal writing, melodic harmonization, and introduction to non-chord tones. Highly recommended to complete this requirement during sophomore year. Open to non-majors with consent of instructor.

MUS 030B Harmony 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 030A; Music majors are required to concurrently enroll in MUS 031B; or consent of instructor. Second of a three-quarter long study of harmony; diatonic chords and non-chord tones followed by diatonic seventh chords. Begins the study of chromatic harmony with secondary dominants. Highly recommended to complete this requirement during sophomore year. Open to non-majors with consent of instructor.

MUS 030C Harmony 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 030B; MUS majors are required to concurrently enroll in MUS 031C; or consent of instructor. Last course of a three-quarter long study of harmony. Includes chromaticism associated with secondary dominants followed by secondary leading tone chords, the Neapolitan chord and augmented sixth chords, and modulations. Highly recommended to complete this requirement during sophomore year. Open to non-majors with consent of instructor.

MUS 031A Music Theory and Musicianship I 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MUS 010; or a passing score on a diagnostic examination. MUS majors are required to concurrently enroll in MUS 030A; or consent of instructor. First of a three quarter-long applied skill-based course integrating concepts learned while concurrently enrolled in MUS 030A. Involves basic sight singing, rhythmic reading, melodic and harmonic dictation, and keyboard harmony. Highly recommended to complete this requirement during sophomore year.

MUS 031B Music Theory and Musicianship I 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MUS 031A; Music majors are required to concurrently enroll in MUS 030B; or consent of instructor. Second of a three-quarter-long applied skills-based course integrating concepts from MUS 030B. Addresses application of non-chord tones to existing melodies and melodic dictation above a harmonic sequence going diatonic triads to diatonic seventh chords and secondary functional chords. Recommended to complete this requirement during sophomore year.

MUS 031C Music Theory and Musicianship I 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MUS 031B; or consent of instructor. Third of a three-quarter long applied skills-based course integrating concepts learned while concurrently enrolled in MUS 030C. Covers sight singing, harmonic diction, and melodic dictation with secondary leading-tone, Neapolitan, and augmented-sixth chords. Highly recommended to complete this requirement during sophomore year.

MUS 032A Class Piano 2 Workshop, 2 hours; activity, 1 hour. Prerequisite(s): MUS 010; or consent of the instructor following the piano diagnostic exam.; or consent of instructor. Develops fundamental skills in piano performance for beginning players. Topics include sight reading, scales, basic improvisation, harmonization, transposition, and repertoire studies. Course is repeatable to a maximum of 12 units.

MUS 032B Class Piano 2 Workshop, 2 hours; activity, 1 hour. Prerequisite(s): MUS 032A; or consent of the instructor following the piano diagnostic exam; or consent of instructor. Second of a two-quarter sequence to develop fundamental skills in piano performance. Topics include sight reading, scales, improvisation, harmonization, transposition, and repertoire studies. Successful completion fulfills the Department of Music's piano proficiency requirement for music majors. Course is repeatable to a maximum of 12 units.

MUS 037 Introduction to Composition 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MUS 001, MUS 010, may be taken concurrently; or consent of instructor. Introduces the art of music composition through applied exercises. Covers basic computer music notation. Course is a prerequisite for Music Majors in the Composition Track.

MUS 044 Introduction to Songwriting 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): none. Explores fundamentals of songwriting from writing lyrics to finding a structure. Focuses on analyzing several songs and techniques from various time periods and creating model exercises.

MUS 073A Dance of Mexico 2 Studio, 3 hours; extra reading, 1 hour; screening, 1 hour, individual studio, 1 hour. Prerequisite(s): none. Covers the traditional dances of Mexico at the beginning level. Includes attendance at dance concerts outside of class. Recommended for both nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with LNST 073A.

MUS 073B Dance of Mexico 2 Studio, 3 hours; extra reading, 1 hour; screening, 1 hour; individual studio, 1 hour. Prerequisite(s): LNST 073A/MUS 073A is recommended. Covers the traditional dances of Mexico at the beginning level. Includes attendance at dance concerts outside of class. Recommended for both nondancers and dancers. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with LNST 073B.

MUS 080 (E-Z) Private Instruction: Voice, Keyboard, and Strings 1 Individual study, 5 hours; studio, 0.5 hour. Consists of a half-hour lesson and practice for 5 to 10 hours each week (see the note regarding fees under the Major Requirements section). Offered as demand indicates. E. Voice; F. Classical Piano; G. Jazz Piano; I. Harpsichord; J. Carillon; K. Jazz Guitar; L. Electronic Bass Guitar; M. Lute; N. Classical Guitar; O. Viola Da Gamba; P. Piano Proficiency; Q. Organ; R. Violin; S. Viola; T. Violoncello; U. Double Bass Viol; V. Harp. Course is repeatable to a maximum of units.

MUS 081 (E-Z) Private Instruction: Brass, Woodwinds, Percussion, and Other Instruments 1 Individual study, 5 hours; studio, 0.5 hour. Consists of a half-hour lesson and practice for 5 to 10 hours each week (see the note regarding fees under the Major Requirements section). Offered as demand indicates. E. Trumpet; F. Trombone; G. Tuba; I. French Horn; J. Flute; K. Oboe; L. Clarinet; M. Bassoon; N. Saxophone; O. Recorder; P. Percussion; R. Bagpipe; S. Scottish Drums; Z. Caribbean Steele Pan. Course is repeatable.

Upper-Division Courses

MUS 111 Music Resources and References 2 Studio, hours; extra reading, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor and/or successful completion of one or more introductory course(s) in the discipline. Introduces the methods of finding and using music resources and references. Explores the musical resources of the UCR libraries and beyond. Topics include but are not limited to UCR's music collections (print, online, and audio formats) including scores, databases, reference sources, journals, and multimedia.

MUS 112A History of Western Music: Middle Ages to 1700 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. An intensive survey of music history and literature from the Middle Ages to 1700. Involves score reading, listening, and analysis of pieces with emphasis on historical characteristics.

MUS 112B History of Western Music: 1700-1900 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. An intensive survey of music history and literature from the 1700 to 1900. Involves score reading, listening, and analysis of pieces with emphasis on historical characteristics.

MUS 112C History of Western Music: Twentieth-Century 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. An intensive survey of music history and literature from 1900 to the present. Involves score reading, listening, and analysis of pieces with emphasis on historical characteristics.

MUS 113 Brazilian Music 4 Lecture, 3 hours; extra reading, 2 hours; assigned listening, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduces the music of Brazil, focusing on the history and the current variety of musical languages, styles, and forms of the present. Analyzes the crucial question of national identity in Brazilian culture and society through the study of its music.

MUS 114 Opera 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Study of selected operas from the Western repertory for 1600 to the present.

MUS 115 Renaissance and Baroque Music of Latin Europe and Latin America 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MUS 112A, MUS 112B, MUS 112C; or upper-division standing and consent of instructor. Study of the sacred and secular musics of Italy, France, the Iberian Peninsula, and Latin America, 1450-1750. Emphasis is on the repertoires, styles, and genres that are relevant to understanding the musical past of the Americas, from (Alta) California to South America.

MUS 116 History of Jazz 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): restricted to class level standing of junior, senior, credential only, or masters; or consent of instructor. An overview of the history of jazz music emphasizing its development in the United States from the nineteenth century to the present. Topics include jazz' origins in southern African American musical practices, the blues, swing, bebop, cool jazz, Latin jazz, and the genre's contemporary internationalization.

MUS 117 Music and Ritual 4 Lecture, 3 hours; written work, 1 hour; fieldwork, 20 hours per quarter, Prerequisite(s): upper-division standing or consent of instructor. Examines music cross-culturally in a ritual context. Incorporates readings from ethnomusicology, anthropology, folklore, and performance studies. Addresses how music operates within specific ritual events and how it relates to cosmology. Also examines the role of music in achieving altered states (dreams, meditation, trance, and possession), as well as helping to constitute gendered authority.

MUS 118 Music, Politics, and Social Movements 4 Lecture, 3 hours; extra reading, 2 hours; assigned listening, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the role of music in social and political movements. Emphasis is on understanding the textual and musical features of politically engaged music within its historical, social, and cultural context.

MUS 119 Javanese Music and Culture 4 Lecture, 3 hours; term paper, 1 hour; online discussion and listening, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines Javanese traditional and contemporary music. Focuses on the music of the Javanese gamelan and its relation to larger cosmological themes. Other topics include rural versus court traditions, popular music, mass media, piracy, Hindu roots, modernity, and local practices versus global trends. Cross-listed with AST 119.

MUS 120 Contemporary Native American Music 4 Lecture, 3 hours; extra reading, 2 hours; listening to prepared audio examples of music, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores the music of Native American peoples today, the contexts and behaviors with which such music is associated, and the ways these elements are discussed within Native communities. Emphasis is on "Pan Indian" music, including music for pow wows and syncretic religious music, and Native popular music, including folk, country, rock, and hip-hop.

MUS 122 Music and Performance in the Andes 4 Lecture, 3 hours; extra reading, 2 hours; assigned listening, 1 hour, Prerequisite(s): upper-division standing or consent of instructor. Introduction to the musical practices of the central Andean countries, including indigenous, mestizo, Creole, and Afro-Andean traditions. Music is presented as part of a broader realm of performance in the Andes, incorporating dance, ritual, drama, and popular culture,

and its relationship with notions of identity, nationalism, modernity, folklore, and politics.

MUS 123 Southeast Asian Performance 4 Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the roles and genres of expressive culture in Southeast Asia, including dance, music, theater, film, and digital culture. Performance is discussed as both a time-honored and a contemporary medium for cultural production, from the courts to everyday experience. Cross-listed with AST 123, ANTH 126, DNCE 123, and SEAS 123.

MUS 124 Music of Asian America 4 Lecture, 3 hours; music listening, 1 hour; individual study, 2 hours, Prerequisite(s): upper-division standing or consent of instructor. Explores music as a window on the cultural politics of Asian America. Examines expressive culture as a constitutive site for ethnic identities and emergent political formations. Covers music of Asian immigrants and of subsequent generations, including Asian American jazz and hip-hop. Cross-listed with AST 124.

MUS 125 Music of Central America, Mexico, and the Caribbean 4 Lecture, 3 hours; extra reading and listening to prepared tapes of music, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of different musical traditions from Central America, Mexico, and the Caribbean, with an emphasis on popular music. Examines the impact of intercultural contact on the musical styles of these regions. A background in Western music is not required.

MUS 126 Gender, Sexuality, and Music in Cross-Cultural Perspectives 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An overview of gendered performance genres from a number of cultures. Explores gender-specific music and notions of gender that are often constructed, maintained, transmitted, and transformed through music and performance. Cross-listed with ANTH 177, and GSST 126.

MUS 127 Music Cultures of Southeast Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in the Philippines, Indonesia, Malaysia, Thailand, Myanmar (Burma), Laos, Cambodia, and Vietnam. Designed for the student interested in the performing arts and cultures of mainland and insular Southeast Asia. No Western music background is required. Cross-listed with ANTH 176, AST 127, DNCE 127, ETST 172, and SEAS 127.

MUS 130A Counterpoint 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MUS 030C, MUS 031C; or consent of instructor. A study of techniques of composing simultaneous, independent melodic lines within selected harmonic and stylistic contexts. Includes but is not limited to sixteenth-century counterpoint. To be taken during junior year.

MUS 130B Counterpoint 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MUS 130A; or consent of instructor. A study of advanced techniques of composing simultaneous, independent melodic lines within selected harmonic and stylistic contexts. Includes but is not limited to eighteenth-century counterpoint. To be taken during junior year.

MUS 131A Music Theory and Musicianship 2 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MUS 031C. Study and practice of music theory. Includes advanced ear training, sight singing, melodic and harmonic dictation, rhythmic skills, keyboard skills, twentieth-century harmony, twelve-tone serialism, atonalism, and electronic and computer music.

MUS 131B Music Theory and Musicianship 2 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MUS 131A. Study and practice of music theory. Includes advanced ear training, sight singing, melodic and harmonic dictation, rhythmic skills, keyboard skills, twentieth-century harmony, twelve-tone serialism, atonalism, and electronic and computer music.

MUS 131C Music Theory and Musicianship 2 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): MUS 131B. Study and practice of music theory. Includes advanced ear training, sight singing, melodic and harmonic dictation, rhythmic skills, keyboard skills, twentieth-century harmony, twelve-tone serialism, atonalism, and electronic and computer music.

MUS 133 Instrumentation 4 Lecture, 3hours; consultation, 1 hour. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. Investigation of the technical and color possibilities of various instruments, with scoring projects.

MUS 134 Orchestration 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 010; or consent of instructor. Advanced scoring projects with emphasis on stylistic aspects and relationship of orchestral color to form.

MUS 136 Jazz Theory 4 Lecture, 3 hours; extra reading and listening to music tapes, 3 hours. Prerequisite(s): MUS 030A; MUS 031A or MUS 031B or MUS 031C; or consent of instructor. Examines concepts and practices in harmony, melody, rhythm, and form as they relate to jazz and other popular idioms. Provides basic ear training for the recognition of changes in traditional jazz tunes, primary blues forms, modulations, and classic jazz bridges.

MUS 137 Composition Seminar 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. Assists in the successful composition of pieces in a variety of genres and media. Includes compositional models and the creation of musical scores. Course is repeatable to a maximum of 12 units.

MUS 138 Form and Analysis in Western Music 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MUS 030C, MUS 031C; strongly recommend music majors complete this course during their junior year, or first-quarter available upon transferring; or consent of instructor. Studies the dynamic design produced by musical elements functioning in context and their significance in shaping music. Explores different approaches to analysis using works in contrasting styles and forms and through practical application of course material.

MUS 140 American Musical Subcultures: A Genealogy of Rock 4 Lecture, 3 hours; extra reading, 0 to 2; listening, 2-3 hours. Prerequisite(s): upper-division standing or consent of instructor. A historical and cultural overview of the genre of American popular music known as "rock." Covers themes ranging from musical form and structure, aesthetics, and audio technology to community and individualism, gender and racial identity, political resistance, and the music industry. Cross-listed with HISA 139.

MUS 140L American Musical Subcultures: A Genealogy of Rock Practicum 4 Lecture, 3 hours; practicum, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; requires concurrent enrollment in 080E, 080G, 080M, 080K, 081P or 180E, 180G, 180M, 180K, 181P, or enrollment in instrument lessons on another rock instrument; or consent of instructor. A historical and cultural overview of the genre of American popular music known as "rock." Covers themes ranging from musical form and structure, aesthetics, and audio technology to community and individualism, gender and racial identity, political resistance, and the music industry.

MUS 142 Film and Video Game Scoring 4 Lecture, 3 hours; discussion, 1 hour; activity, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to scoring films and video games. Explores instrumentation, drama, orchestration, and new technologies in a multimedia context. Discusses approaches to storytelling in virtual, digital, and cinematic art forms.

MUS 145A Digital Audio and Sound 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. College math is recommended. An introduction to the theory and practice of manipulating digital sound. Provides an understanding of digital audio devices associated with media production and of audio processing in general. Topics include basic psychoacoustics, digital audio theory, and digital audio editing.

MUS 145B Digital Audio and Sound 4 Lecture, 3 hours; laboratory, 4 hours; Prerequisite(s): MUS 145A or theory proficiency and practical experience in digital audio. Advanced theory and practice of manipulating digital sound. Includes sound processing, synthesis, and composition, as well as multimedia and audiovisual composition and interactive media production. Provides an understanding of dedicated software for sound, music, and multimedia, including the programming environment Max/MSP. Course is repeatable to a maximum of 8 units.

MUS 146 Genealogy of Electronica 4 Lecture, 3 hours; term paper, 1 hour; online discussion and listening, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the history of electronica and electronic music. Focuses on particular issues, including youth culture, dance and ecstatic trance, subcultures and club cultures, hallucinogenic drugs and psychedelic aesthetics, globalization, audio piracy, media and audio technologies, music and politics, and gender and sexuality.

MUS 147 Advanced Contemporary Analysis: Music After 1945 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): MUS 138 or consent of instructor. A study of the diverse range of styles and movements of Western art music from 1945 through the present. Examines critical repertoire through a historical context including issues of pitch derivation, formal architecture, and compositional aesthetics. Satisfactory (S) or No Credit (NC) grading is not available.

MUS 148 Sound Studies and Sound Art 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduction to the interdisciplinary field of sound studies and sound art. Explores cultural, social, political, and philosophical issues of sound, listening, and auditory media. Examines the contemporary practices of sound production including the experimental field of sound art. Cross-listed with GBST 148.

MUS 149 Composition Forum and Studio 4 Colloquium, 1.5 hours; consultation, 1.5 hours; individual study, 3 hours. Prerequisite(s): MUS 037; restricted to class level standing of junior, or senior; open to Music Majors in the Composition Track; or consent of instructor. Individual or group lessons featuring applied composition exercises and listening assignments in various styles. Students share works in progress and attend guest lectures during a weekly forum. Course is repeatable to a maximum of 16 units.

MUS 150A Instrumental Technique: Strings 2 Lecture, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of basic techniques of orchestral string instruments.

MUS 150B Instrumental Technique: Woodwinds 2 Lecture, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of basic techniques of orchestral woodwind instruments.

MUS 150C Instrumental Technique: Brass 2 Lecture, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of basic techniques of orchestral brass instruments.

MUS 150D Instrumental Technique: Percussion 2 Lecture, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Study of basic techniques of orchestral percussion instruments.

MUS 150E Instrumental Technique: Voice Studio 2 Studio, 4 hours. Prerequisite(s): MUS 080E and MUS 180E. An introduction to performance that provides singers an opportunity to present and perform the material on which they are currently working. Also reviews the International Phonetic Alphabet and how it may be applied to improve a singer's pronunciation and understandability by an audience. Course is repeatable to a maximum of 4 units.

MUS 151 Orchestral Conducting 4 Lecture, 3 hours; studio, 2 to 3 hours. Prerequisite(s): consent of instructor. Fundamentals of baton technique, score study, transposition, and stylistic analysis as they relate to problems of conducting.

MUS 152 Choral Conducting 4 Lecture, 3 hours; studio, 2 to 3 hours. Prerequisite(s): consent of instructor. Study of choral repertoire, rehearsal methods, voice production, and techniques of conducting.

MUS 153 Queerness and Music (currently Titled "homosexuality and Music") 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Uses a topical rather than a chronological approach to investigate homosexuality on the part of composers, performers, critics, theorists, and historians and how this has shaped the history of music in the West.

MUS 154 (E-Z) Critical Approaches to the Western Canon 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): MUS 112A; MUS 112B; MUS 112C. Critical study of selected repertoires within Western music, and the multiple and potentially problematic aspects of their construction as iconic and paradigmatic. E. Beethoven: The Music &the Myth.

MUS 155 (E-Z) Seminar in Dance and Music 4 Seminar, 3 hours; term paper, 3 hours. Introduces relationships and representations between music and dance. Explores musical and choreographic form, compositional strategies, hybridization of style, cultural meanings and registers in which these were made, the agencies such representations enabled, interpretive communities, and cross-cultural interactions. Cross-listed with DNCE 155 (E-Z).

MUS 155E Representations of Spain in Dance and Music, 1700-2000 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces representations of Spain articulated in music and dance of Europe and the Americas from the eighteenth through twentieth centuries. Cross-listed with DNCE 155E.

MUS 155F The Ballets Russes 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores how the Diaghilev Ballets Russes' repertoire and collaborative practices challenged the nature of artistic labor; negotiated traditional patronage and new commercial modes; engaged with cultural nationalism, gender role contention, and emerging models of sexuality; and deployed representational strategies that played into period debates about power and social organization. Cross-listed with DNCE 155F.

MUS 157 Topics Interdisciplinary Approaches to Composition 4 Lecture, 3 hours; activity, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines interdisciplinary and critical approaches to composition (understood in a broad sense) that are not part of the regular curricular offerings. Course content varies and is announced as the course is offered. Course is repeatable as content or topic changes to a maximum of 12 units.

MUS 160 Orchestra 1 to 2 Studio, 2 to 6 hours. Prerequisite(s): consent of instructor. Study and performance of standard orchestral literature. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. May be repeated for credit.

MUS 161 Collegium Musicum 1 to 2 Activity, 2 To 6 hours. Prerequisite(s): consent of instructor. Study and performance of Medieval, Renaissance, and Baroque music. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. May be repeated for credit.

MUS 162 University of California, Riverside Chorale 1 to 2 Studio, 2 to 6 hours. Prerequisite(s): consent of instructor. Study and performance of standard choral literature. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 32 units.

MUS 163 Chamber Singers 1 to 2 Studio, 2 to 6 hours. Prerequisite(s): consent of instructor. Study and performance of works selected from different genres and periods. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

MUS 164 Jazz Ensemble 1 to 2 Studio, 2 To 6 hours. Prerequisite(s): consent of instructor. Study and performance of literature for large jazz ensemble and stage band, and preparation of improvised solos. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

MUS 165 Wind Ensemble 1 to 2 Studio, 2 to 6 hours. Prerequisite(s): or consent of instructor. Study and performance of literature for the concert band. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

MUS 166 (E-Z) Chamber Music 1 to 2 Studio, 3 hours. Study and performance in varied small ensembles. E. Musical Instrument Digital Interface (midi) Ensemble; F. Improvisatory Ensemble; G. Chamber Music. Course is repeatable to a maximum of units.

MUS 167 Senior Recital 2 Activity, 6 hours. Prerequisite(s): consent of instructor. Preparation and presentation of a formal recital. Limited to advanced performers only. Graded Satisfactory (S) or No Credit (NC).

MUS 168 Javanese Gamelan Ensemble: Beginning 2 Studio, 6 hours. Prerequisite(s): upper-division standing and consent of instructor. Study and performance of the Central Javanese gamelan, consisting mainly of gongs and gong-chime instruments. Readings and discussions focus on Javanese culture. Course is repeatable. Cross-listed with AST 168 and SEAS 168

MUS 169 Taiko Ensemble 1 Studio, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Study and performance of Japanese drumming. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable. Cross-listed with AST 169.

MUS 170 Rondalla Ensemble 1 to 2 Studio, 2 to 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Study and performance of the Filipino rondalla, an ensemble consisting of various sizes of lute-like and guitar-like instruments. Discussions focus on Filipino culture. Cross-listed with AST 170 and SEAS 170. Courses is repeatable.

MUS 174 Latin American Music Ensemble 1 to 2 Studio, 2 to 6 hours. Prerequisite(s): upper-division standing or consent of instructor. Study and performance of select Latin American folk music traditions, with special emphasis on music of the Andean region. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work. Course is repeatable.

MUS 175A Beginning Mariachi Ensemble 1 to 2 Studio, 3 hours; individual studio, 1-2 hours. Prerequisite(s): upper-division standing or consent of instructor. A study and performance of selections from the Mexican folk music tradition. Emphasizes mariachi and son jarocho. Includes popular corridos and rancheras. Students who participate in a performance and submit a written review receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

MUS 175B Intermediate Mariachi Ensemble 1 to 2 Studio, 3 hours; individual studio, 1- 2 hours. Prerequisite(s): MUS 175A or consent of instructor. A study and performance of selections from the Mexican folk music tradition. Emphasizes mariachi and son jarocho. Includes popular corridos and rancheras. Students who participate in a performance receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

MUS 176 Bagpipe Ensemble 1 Studio, 2 hours. Prerequisite(s): consent of instructor. Study and performance of Scottish bagpipe music. Students who participate in a performance receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

MUS 177 Music of North India: Tabla (drums) 1 to 2 Studio, 2 to 4 hours. Prerequisite(s): upper-division standing and consent of instructor. Explores the tradition of the Hindustani/North Indian tabla, which are a pair of drums that accompany improvised solos on melody instruments such as the sitar. Considers the tabla as a virtuosic solo instrument. Course is repeatable.

MUS 179 Music Improvisation Ensemble 1 to 2 Studio, 3 to 6 hours. Prerequisite(s): upper division standing and consent of instructor. Participation in an improvisational ensemble comprised of electronic (preferably laptop computer based) and/or electro-accoustical musical instruments. Rehearsals will cover a range of improvisational techniques from highly structured to free form and from tonality to noise experimentation. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable to a maximum of 24 units.

MUS 180 (E-Z) Private Instruction: Voice, Keyboard, and Strings 2 Individual study, 5 hours; studio, 1 hour. Consists of an one-hour lesson and practice for 5 to 10 hours each week (see the note regarding fees under the Major Requirements section). Offered as demand indicates. E. Voice; F. Classical Piano; G. Jazz Piano; I. Harpsichord; J. Carillon; K. Jazz Guitar; L. Electric Bass Guitar; M. Lute; N. Classical Guitar; O. Viola Da Gamba; P. Piano Proficiency; Q. Organ; R. Violin; S. Viola; T. Violoncello; U. Double Bass Viol; V. Harp. Course is repeatable to a maximum of units.

MUS 181 (E-Z) Private Instruction: Brass, Woodwinds, Percussion, and Other Instruments 2 Individual study, 5 hours; studio, 1 hour. Consists of an one-hour lesson and practice for 5 to 10 hours each week (see the note regarding fees under the Major Requirements section). Offered as demand indicates. E. Trumpet; F. Trombone; G. Tuba; I. French Horn; J. Flute; K. Oboe; L. Clarinet; M. Bassoon; N. Saxophone; O. Recorder; P. Percussion; R. Bagpipe; S. Scottish Drums; Z. Caribbean Steele Pan. Course is repeatable.

MUS 183 Percussion Ensemble 1 to 2 Studio, 2 to 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Study and performance of percussion ensemble literature. Course is repeatable..

MUS 184 Genealogy of Hip Hop 4 Lecture, 3 hours; extra reading, 3 hours; listening, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces hip hop culture from its origins to its contemporary global spread. Focuses particularly on rap music, addressing themes evoked in hip hop practice, particularly regionalism, feminism, gender identity, racialization, and globalization.

MUS 185 Arts, Management, and Community 4 Lecture, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to business and arts management including the study of film and television production, stage management, and music production. Offers hands-on experience for practicing management skills working in partnership with local organizations and artists of Riverside and the Inland Empire. Cross-listed with TFDP 185. Credit is awarded for only one of MUS 185/TFDP 185 or MUS 185S/TFDP 185S.

MUS 185S Arts, Management, and Community 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to business and arts management including the study of film and television production, stage management, and music production. Offers hands-on experience for practicing management skills working in partnership with local organizations and artists of Riverside and the Inland Empire. Cross-listed with TFDP 185S. Credit is awarded for only one of MUS 185/ TFDP 185 or MUS 185S/TFDP 185S.

MUS 190 Special Studies 1 to 5 Prerequisite(s):To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable to a maximum of 12 units.

MUS 191 (E-Z) Seminar in Music 4 Seminar, 3 hours; individual study, 3 hours. Topics dealing with aspects of individual composers and genre studies. F. Music Of Beethoven; H. Construction Of Early Instruments; I. Performance Practice; J. Music Of Haydn; K. Interpretation Of Symphonic Literature; M. Russian Romantic Music; N. Early American Music; O. Music Of Mozart; R. Survey Of Sonatas From The Seventeenth Through The Twentieth Centuries; S. The Evolution And Practice Of Jazz; U. Music Criticism; V. Studies In Twentieth-century Music.

MUS 194 Independent Reading 1 to 2 Prerequisite(s): junior standing Independent reading in materials not covered in course work. Normally begun in the junior year. May be repeated for credit. Total credit for course 194 may not exceed 4 units.

MUS 195 Senior Thesis 1 to 4 Required for students who are candidates for honors in music. Open to other music majors by invitation. Total credit may not exceed 6 units.

MUS 198 R'course: Variable Topics 1 Activity hours vary per R'Course proposal, Prerequisite(s): permission needed from department; sophomore standing or better. An opportunity for UCR undergraduate students to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original course topics are variable and unique from other departmental course offerings, designed to highlight the student facilitators' expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC).

Course is repeatable as topics change to a maximum of 8 units.

MUS 198I Individual Internship 1 to 12 variable hours, Prerequisite(s): upper-division standing; evidence of prior arrangements with the professional(s) involved; approval by the department chair after consulting the music faculty. Work with an appropriate professional individual or organization to gain experience and skill in the student's chosen specialty. Graded Satisfactory (S) or No Credit (NC). May be repeated to a total of 16 units.

MUS 199H Senior Honors Research 1 to 5 Research, 3-15 hours.

Graduate Courses

MUS 200 Music Bibliography 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Fundamentals of music bibliography. Emphasizes reference materials and other standard bibliographical tools. Covers research tools and professional writing.

MUS 201 Proseminar in the Analysis of Western Music 4 Seminar, 3 hours; individual guided research, 3 hours. Prerequisite(s): graduate standing. Analysis of selected musical works from various periods exploring different music-theory models.

MUS 206 Proseminar in Musicology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): MUS 200; graduate standing. Study of significant issues and recent developments in musicology and criticism. Study and practice of expository writing about music. Covers research methods and professional ethics.

MUS 207A Proseminar in Ethnomusicology: History and Foundations 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Explores the early history of ethnomusicology as a discipline. Includes its foundation in comparative musicology and its connections with folklore.

MUS 207B Proseminar in Ethnomusicology: Current Theoretical Directions 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Explores ethnomusicology as a discipline. Focuses on the relationships between ethnomusicology and musicology and on ethnomusicology as an interdisciplinary field. Draws from performance studies, ethnopoetics, postmodernism, translational theories, and postcolonialism. Covers research methods and professional ethics.

MUS 207C Proseminar in Ethnomusicology: Public Sector 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Explores ethnomusicology careers in the public sphere outside educational institutions. Draws from ethnomusicology, folklore, anthropology, and public history. Covers archives, museums, non-profit organizations, tourism, prisons, community-driven cultural projects, and public writing. Addresses national, state, and local infrastructures. Explores the skills, methods, and ethics involved in a public sphere career.

MUS 232 Soundtrack Composition 3 Lecture, 3 hours; individual study, 1 hour. Prerequisite(s): MUS 145A or MUS 145B or consent of instructor; graduate standing or both upper-division standing and keyboard proficiency. Concerns musical composition for visual art and entertainment. Covers classic underscoring for dramatic effect, experimentation with music use in film and live-scripted situations, and composition of a musical piece. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

MUS 249 Audiovisual and Multimedia Composition 4 Lecture, 3 hours; individual study, 4 hours. Prerequisite(s): graduate standing. Explores new fields of artistic creativity emerging from the convergence of sound and image. Focuses on audiovisual and multimedia composition, as well as on the collaboration process embracing research, composition, and performance. Encourages exploration of the links among sound, image space, environment, and digital media. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

MUS 252 Notation For Composers 4 Lecture, 3 hours; individual study, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Combines a critical study of notation history and survey of contemporary techniques for the conceptualization and display of visual information with computer-oriented musical applications. Includes common practice computer music notation, graphics software, and the translation of data between music software. Students advanced to candidacy for the Ph.D. receive a Satisfactory (S) or No Credit (NC) grade.

MUS 254 Listening 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. An in-depth study of soundscapes, deep listening, mediated listening, and improvisation. Applies concepts from a variety of situated listening practices. Requires active music making and participation in embodied listening activities. Ability to read musical notation not required. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

MUS 255 Field Methods in Ethnomusicology 4 Seminar, 3 hours; research, 1 hour; field, 2 hours. Prerequisite(s): graduate standing. A theoretical and practical introduction to fieldwork in music and performance. Each student focuses on a different performance group and documents its activities. Covers interviewing, audiotaping, videotaping, transcribing music and dance, and describing performance events.

MUS 256 Electroacoustic and Computer Music Composition 4 Seminar, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor; MATH 004 or equivalent is recommended. Covers electroacoustic and computer music composition techniques in the context of development of original pieces. Topics include electronic and computer music history and theory, as well as digital audio and sound processing theory (including synthesis techniques and real-time sound processing and instrument design).

MUS 257 Music and Audio Production 4 Lecture, 3 hours; studio, 8 hours per quarter; individual study, 3 hours. Prerequisite(s): MUS 145A; MUS 145B or consent of instructor. Addresses techniques of commercial music production, including recording, editing, sequencing, notation preparation, and sound reinforcement. Combines an examination of the history of commercial sound aesthetics with structured exercises in producing, including software benchmarking, project management, budgeting, audio devices, mastering, and design for sound reinforcement and miking. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

MUS 258 Composition Seminar 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Individual projects and issues in musical composition. Course is repeatable.

MUS 259 Musical Semiotics: Approaches to Meaning and Form 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Study of musical semiotics focusing on recent theories and related areas such as cybernetics, cognitive science, and theory of systems. Examines questions of meaning and form in the domains of aesthetics, musical theory, analysis, composition, performance, and new approaches of digital media and music.

MUS 261 Seminar in Performance Practice 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): MUS 200 and MUS 201, or consent of instructor. Investigations into the historically accurate performance styles of music based on information contemporary with the music. Topics and content will vary each quarter depending on student interest. May be repeated for up to 8 units.

MUS 262 Seminar in Western Music History 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): MUS 206, graduate standing; or consent of instructor. Addresses selected issues in the history of music in the context of the social, political, religious, and intellectual culture of the West. Focuses on historical and analytical literature on particular historical periods. Course is repeatable.

MUS 263 Seminar in Special Topics in Musicology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Focuses on current scholarship in musicology and related fields with a strong critical content. Addresses particular topics relative to history, style, and audience, including : nationalism, gender and sexuality in music, identity in music, music and technology studies, music and culture studies, and more. Course is repeatable.

MUS 265 Electroacoustic Music: History, Theory, and Aesthetics 4 Lecture, 3 hours; individual study, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on historical, theoretical, and esthetic issues of electroacoustic music from the beginning of the twentieth century to the present. Topics include foundations of electroacoustic music, electronic music studios, analog and digital technology, sound art, and live electronics. Includes listening to and analysis of key works of electroacoustic music.

MUS 266 Seminar in Improvisational Studies 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on specific musical concepts and processes as well as broader sociocultural issues related to improvisational performance. Designed for graduate and approved upper-level undergraduate students interested in the scholarly study of music improvisation and contemporaneous musicality.

MUS 270 Special Topics in Ethnomusicology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Focuses on current scholarship in ethnomusicology and related fields. Emphasis is usually on theory and methodology or the study of particular performance traditions. Theme varies each quarter. Course is repeatable to a maximum of 24 units.

MUS 271 Area Studies Research in Music 4 Seminar,3 hours; extra reading; 2 hours; listening, 1 hour, Prerequisite(s): graduate standing or consent of instructor. Focuses on historical and ethnographic literature of particular geographical areas. Discusses scholarly literature on music (and expressive culture generally, including dance, theater, and ritual) of a particular geocultural region. Course is repeatable as topics change to a maximum of 8 units.

MUS 272 Musics of Southeast Asia 4 Seminar, 3 hours; term paper, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on historical and ethnographic literature of Southeast Asia and its diasporas. Discusses scholarly literature on music and expressive culture generally, including dance, theater, and ritual. Cross-listed with SEAS 201.

MUS 290 Directed Studies 1 to 6 Seminar 1 to 6 hours. Prerequisite(s): graduate standing. Directed studies. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MUS 291 Individual Study in Coordinated Areas 1 to 6 Individual Study, 6 to 25 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. A program of study designed to assist graduate candidates who are preparing for M.A. comprehensive or Ph.D. qualifying examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MUS 292 Concurrent Analytical Studies in Music 1 to 4 Prerequisite(s): graduate standing; approval of instructor and graduate advisor. Each 292 course will be taken concurrently with some 100-series course but on an individual basis. It will be devoted to research, criticism, and written work of a graduate order commensurate with the number of units elected. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

MUS 293 Composition Practicum 1 Lecture, 1 hour; practicum, 8 hours per quarter; individual study, 3 hours; Studio, 16 hours per quarter. Prerequisite(s): graduate standing or consent of instructor. A series of performance activities and appreciation for composers. Includes production of a composition concert and attendance at designated presentations in music and scholarship. Addresses career and job market guidance. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

MUS 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor; graduate advisor. Individual graduate student research under the sponsorship of specific faculty members. Addresses topics and selected problems in theoretical and historical research in music not directly related to student's thesis. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MUS 299 Research For Thesis Or Dissertation 1 to 12 Thesis, 3 to 36 hours. Prerequisite(s): graduate standing; or consent of instructor. Research for Thesis or Dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

MUS 301 Directed Studies in the Teaching of Music 3 Seminar, 2 hours; consultation, 1 hour. Prerequisite(s): graduate standing. A program of weekly meetings and individual formative evaluation required of new Music teaching assistants. Covers instructional methods and classroom/section activities. Conducted by department faculty. Graded Satisfactory (S) or No Credit (NC).

MUS 302 Teaching Practicum 1 Practicum, 3 hours. Prerequisite(s): appointment as a teaching assistant in Music; graduate standing; or consent of instructor. Supervised teaching in undergraduate Music courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MUS 400 Research and Professional Development Workshop 1 Workshop, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Addresses recent trends and methods of research. Covers strategies for job placement and public speaking. Organized in conjunction with the Music Graduate Students Association. Topics presented by faculty and guest lecturers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 18 units.

Natural and Agricultural Sciences

Subject abbreviation: NASC
College of Natural and Agricultural Sciences

Lower-Division Courses

NASC 091 Freshman Advising Seminar in the Natural and Agricultural Sciences 1 Seminar, 1 hour. Prerequisite(s): first-year freshman standing in the College of Natural and Agricultural Sciences (CNAS). Introduction to UCR for students in the sciences. Includes selection of majors, curriculum planning, career options and goals in the sciences, opportunities for undergraduate research, development of learning and study skills, ethics in research and education, and an introduction to the faculty in CNAS. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of BCH 095, NASC 091, or NASC 093.

NASC 092 Lower Division Seminar in the Natural and Agricultural Sciences 1 Seminar, 10 to 15 hours per quarter. Prerequisite(s): freshman or sophomore standing; or consent of instructor. Introduction to one of the many areas of study explored by the faculty and alumni of natural and agricultural sciences in a small-group, highly interactive format. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units of any combination of ENGR 092, HASS 092, and NASC 092; students may enroll in only 1 unit of ENGR 092, HASS 092, or NASC 092 per quarter.

NASC 093 Freshman Advising Seminar in the Natural and Agricultural Sciences 2 Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): first-year freshman standing in the College of Natural and Agricultural Sciences (CNAS). Introduction to UCR for students in the sciences. Includes selection of majors, curriculum planning, career options and goals in the sciences, opportunities for undergraduate research, development of learning and study skills, ethics in research and education, and an introduction to the faculty and professional academic advisors in CNAS. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of BCH 095, NASC 091, or NASC 093.

NASC 094 Adventures in Science: Issues, Research, Careers, Ethics and More 1 to 2 Seminar, 1 to 2 hours. Prerequisite(s): restricted to class level standing of freshman; or consent of instructor. An introduction to the science major including issues, related research, and the available avenues for those who attain a degree in that major. Focuses on research and academic ethics, career pathways, study habits, and the application of the major to current issues and careers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content or topic changes to a maximum of 3 units.

NASC 096 Environment and Society 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): lower-division standing or consent of instructor. Presents major environmental issues facing society from an interdisciplinary perspective. Topics may include water, energy, climate change, and urbanization. Cross-listed with ENGR 096, and HASS 096.

NASC 097 Undergraduate Research Seminar 1 to 2 Seminar, 1 to 2 hours. Explores and discusses current research topics through presentations and discussions by students, faculty, other scientists, and visiting speakers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content or topic changes to a maximum of 6 units.

Upper-Division Courses

NASC 171 Globalization 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Covers technological drivers of globalization. Includes social, economic, and political consequences. Explores the cultural aspects of globalization, including barriers and drivers for economic and cultural interdependence and integration. Also explores virtual global organizations. Cross-listed with ENGR 171, and PBPL 171.

NASC 188 Introduction to Oral Presentations 2 Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): enrollment in the MARC-USTAR program. Prepares science majors for oral presentations and formal research talks. Includes student presentations and discussions. Also covers the electronic preparation of figures and tables.

NASC 189 Reading and Analysis of Scientific Articles 1 Lecture, 1 hours. Prerequisite(s): enrollment in the MARC-USTAR program. Introduces the analysis of biomedically-aimed scientific articles. Includes reading of current research papers, presentation of data, and critiquing of papers.

NASC 191S Seminar in Sacramento 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Center at Sacramento Program. Examines aspects of the Sacramento area, including cultural, political, and governmental institutions and the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Sacramento. Required of participants in the UCR Center at Sacramento Program. Cross-listed with HASS 191S, and ENGR 191S.

NASC 192 Introduction to Stem Teaching 1 Seminar, 1 hour. Prerequisite(s): EDUC 003, may be taken concurrently; Restricted to class level standing of sophomore, junior, or senior; and consent of instructor. Covers preparation for a career in mathematics and science teaching in the K-12 classroom. Includes introduction to science/math pedagogy and evaluation of student learning. Designed for students who plan to teach science or mathematics in the public school system.

NASC 192L Introduction to Stem Teaching Laboratory 1 Discussion, 1 hour; laboratory, 2 hours. Prerequisite(s): EDUC 003, may be taken concurrently, NASC 192, may be taken concurrently; Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Covers preparation for a career in mathematics and science teaching in the K-12 classroom. Includes introduction to science/math pedagogy and evaluation of student learning. Laboratory field work includes participation and observation in public school classrooms.

NASC 198 R'course: Variable Topics 1 Activity, 1 to 3 hours. Prerequisite(s): permission needed from department; sophomore standing or better. An opportunity for UCR undergraduate students to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original course topics are variable and unique from other departmental course offerings, designed to highlight the student facilitators' expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 8 units.

NASC 198I Individual Internship in the Natural and Agricultural Sciences 1 to 12 Internship, 2 to 24 hours; written work, 1 to 12 hours. Prerequisite(s): upper-division standing in the College of Natural and Agricultural Sciences (CNAS); consent of instructor. An internship to provide CNAS students with on-the-job experience in government, industry, or clinical laboratories. Each individual project must be approved by the CNAS associate dean and the laboratory director where the internship is to be carried out. Requires a written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

Nematology

Subject abbreviation: NEM
College of Natural and Agricultural Sciences

Adler R. Dillman, Ph.D., Chair
Department Office, 2017B Genomics
(951) 827-3912
nematology.ucr.edu

Professor
Adler R. Dillman, Ph.D.
Isgouhi Kaloshian, Ph.D.

Professors Emeriti
James G. Baldwin, Ph.D.
Edward G. Platzer, Ph.D. (Nematology/Biology)
Philip A. Roberts, Ph.D.

Associate Professor
Paul De Ley, Ph.D. (Emeritus)

Assistant Professor
Simon "Niels" Groen, Ph.D.
Bao Lam Huynh, Ph.D.
Jieu-in Yang, Ph.D.

Professors of Cooperative Extension
J. Ole Becker, Ph.D.
Antoon T. Ploeg, Ph.D.
Andreas Westphal, Ph.D.
Affiliated Faculty
Michael V. McKenry, Ph.D. (Emeritus)

Cooperating Faculty
Morris F. Maduro, Ph.D. (Molecular, Cell, and Systems Biology)
Meera G. Nair, Ph.D. (Biomedical Sciences)

Nematology is the study of roundworms, the most genetically diverse invertebrate phylum that occurs worldwide in virtually every environment. Only about 3 percent of all species have been studied or identified, and these include significant parasites of humans, animals, and plants. A primary mission of the Department of Nematology is to develop environmentally sound approaches to manage nematodes that worldwide cause nearly $100 billion annual damage to crops. Other objectives are to use nematodes that benefit agriculture and the environment as agents of nutrient cycling and soil fertility and for biological control of some insect pests. Additional objectives focus on nematodes as fundamental models for addressing basic biological questions in genetics, development, and molecular biology. The department offers graduate and postgraduate opportunities in biocontrol, ecology, genetics, molecular biology, physiology, and systematics. It offers specific expertise in applied nematode problems of subtropical and desert agriculture.

A graduate program in Nematology is offered within a broad biological context. Students are enrolled in a more general department or interdepartmental program that provides a core of graduate courses. The general departments may include Botany and Plant Sciences, Entomology, Evolution, Ecology, and Organismal Biology, Microbiology and Plant Pathology, and Environmental Sciences as well as a wide range of interdepartmental programs. Dissertation research opportunities, major research professor, curriculum advisor, and specific courses are provided by the Department of Nematology to complement requirements of the more general department or program.

Upper-Division Courses

NEM 120 Soil Ecology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 002 or BIOL 005A, BIOL 05LA; CHEM 001C, CHEM 01LC or CHEM 01HC, CHEM 1HLC; ENSC 100; or consent of instructor. A study of soil biota and their relationships with plants and the soil environment. Emphasizes life strategies of soil organisms and methods to study them. Examines importance of microbial and faunal groups from the rhizosphere to the ecosystem. Explores impact on soil fertility, carbon and nitrogen cycles, and Earth's climate. Cross-listed with ENSC 120.

NEM 159 Biology of Nematodes 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C, MATH 007B or MATH 009B or MATH 09HB, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC, BCH 100 or BCH 100H or BCH 110A or BCH 110HA, STAT 010. An introduction to the biology of nematodes. Topics include the morphology, physiology, development, genetics, behavior, and ecology of nematodes from parasitic and free-living habitats. Includes observing the comparative morphology and biology of nematodes and giving oral presentations on selected nematode life histories. Cross-listed with BIOL 159.

NEM 190 Special Studies 1 to 4 Individual Study, 3 to 12 hours. Prerequisite(s): consent of instructor and Department Chair. Individual study, directed by a faculty member, to meet special curricular needs. A written report is required. Course is repeatable.

NEM 197 Research For Undergraduates 1 to 4 Laboratory, 3 to 12 hours. Prerequisite(s): upper-division standing. Research in nematology with the guidance of a Nematology faculty member. A written report is required. Course is repeatable.

NEM 199 Senior Research 2 to 4 Laboratory, 6 to 12 hours. Prerequisite(s): senior standing, a grade of "B+" or better in an upper-division Biology course, a grade of "B+" or better in an upper-division Nematology course; or consent of instructor. Individual research on a problem relating to Nematology. A written proposal signed by the supervising faculty member must be approved by the major advisor and the department chair and a written report filed with the supervising faculty member. Course is repeatable to a maximum of 9 units.

Graduate Courses

NEM 205 Identification of Plant Parasitic Nematodes 1 Lecture, 5 hours; laboratory, 25 hours. Prerequisite(s): graduate standing or consent of instructor. Five-day lecture and laboratory course on morphological identification of economically important plant parasitic nematodes in Tylenchida and Dorylaimida using dissecting and bright field microscopy. Includes preparation of microscope slides, diagnosis of field samples, and use of diagnostic keys. Offered in summer only.

NEM 206 Phytopathogens: Nematodes 2 Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Recognition, diagnosis, biology, and control of major nematode diseases of plants. Laboratory covers identification techniques, soil sampling and processing techniques, and process of pathogenesis. Cross-listed with PLPA 206.

NEM 250 Seminar in Nematology 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Intensive study of selected topics in nematology. Includes lectures by students, staff, faculty, and invited scholars on related subjects. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

NEM 270 Special Topics in Nematology 1 Seminar, 2 hours. Prerequisite(s): graduate standing; consent of instructor. Discussion of current literature within special areas of nematology. Graded Satisfactory (S) or No Credit (NC).

NEM 290 Directed Studies 1 to 6 Prerequisite(s): graduate standing. Individual studies on specially selected topics in nematology under the direction of a staff member. Graded Satisfactory (S) or No Credit (NC).

NEM 297 Directed Research 1 to 6 Research 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Experimental studies on specially selected topics in nematology under the direction of a staff member. Graded Satisfactory (S) or No Credit (NC).

Neuroscience Undergraduate Major

Subject abbreviation: CBNS
College of Humanities, Arts, and Social Sciences
College of Natural and Agricultural Sciences

Edward Korzus, Ph.D., Chair
Undergraduate Program for Neuroscience
Department of Psychology

Scott N. Currie, Ph.D., Vice-Chair
Undergraduate Program for Neuroscience
Molecular, Cell and Systems Biology

Program Office, 1223 Pierce Hall
(951) 827-7294
cnasstudent.ucr.edu/neuroscience

Committee in Charge

- Michael Adams (Molecular, Cell and Systems Biology, and Entomology)
- Margarita Curras-Collazo (Molecular, Cell and Systems Biology)
- Scott Currie (Molecular, Cell and Systems Biology)
- Peter Hickmott (Psychology)
- Edward Korzus (Psychology)
- Khaleel Razak (Psychology)
- Daryle Williams, Dean, College of Humanities Arts, and Social Sciences, *ex officio*
- Peter Atkinson, Dean, College of Natural and Agricultural Sciences, *ex officio*

Major

The Neuroscience major is an intercollege major offered by the colleges of Humanities, Arts, and Social Sciences and Natural and Agricultural Sciences. It offers upper-division courses that contribute to an academic program emphasizing the functioning of nervous systems at the molecular, cellular, system, behavioral, and cognitive levels. Some of the topics covered include neuroanatomy, neurophysiology, and neurochemistry in humans and other animals; neural mechanisms underlying sensory system function and perception; neural organization of behavior; development of the nervous system; and neural mechanisms of learning and memory.

Both a B.A. and a B.S. degree are offered by each college. When students declare the major, they choose from which college they wish to have their degree awarded. Students whose degrees are awarded by the College of Humanities, Arts, and Social Sciences are advised in and have their records maintained by the Department of Psychology; students whose degrees are awarded by the College of Natural and Agricultural Sciences are advised in and have their records maintained by the CNAS Academic Advising Center. Breadth requirements vary by college; and students must fulfill the breadth requirements of the college they choose.

For information about student advising, contact the CNAS Academic Advising Center, (951) 827-7294, or the Department of Psychology, (951) 827-5386, University of California, Riverside, Riverside, CA 92521.

Change of Major Criteria

Students must be in good academic standing at the time the Change of Major Petition is filed. Students must successfully repeat any outstanding Neuroscience Core course prior to acceptance into the major.

2nd and 3rd Quarter Freshmen

The following math and science courses must be completed with a grade of C– or better: CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, MATH 007A or MATH 009A

4th Quarter Freshman and Sophomore (up to 89 earned units)

The following math and science courses must be completed with a grade of C– or better: CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, CHEM 01LC, BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, MATH 007A or MATH 009A, MATH 007B or MATH 009B

Junior (90 - 134 earned units)

The following math and science courses must be completed with a grade of C– or better: CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, CHEM 01LC BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C, MATH 007A or MATH 009A, MATH 007B or MATH 009B and completion of at least one of the following sequences with no grade lower than a C–: CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC, PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB, PHYS 002C, PHYS 02LC

Senior (135 + units)

The following math and science courses must be completed with grade of C– or better: CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, CHEM 01LC, BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C, MATH 007A MATH 009A, MATH 007B or MATH 009B, CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC, PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB, PHYS 002C, PHYS 02LC, PSYC 011 or STAT 004 or STAT 010, BCH 100 or BCH 110A, CBNS 106

GPA in upper division courses applied to the Neuroscience Major (Tier 1, 2, and 3) must be 2.00 or higher.

Transfer Students

Transfer applicants must have a minimum GPA of 2.70 (currently 2.70, but can be adjusted upward for selectivity by the college of Majors). Transfer applicants must further meet two of the curricular preparation requirements below.

1. Math 007A or Math 009A; MATH 007B or MATH 009B or equivalent.
2. Two semesters of a single lab-based science discipline (e.g. Chemistry or Biology or Physics).
3. The equivalent of Math 009C plus one semester of Vector Calculus or Linear Algebra.

Individual Majors can (and do) set their particular curricular requirements to be more rigorous.

University Requirements

See Undergraduate Studies section.

College Requirements

College breadth requirements vary depending on which college is chosen to award the degree. For details on breadth requirements, see the Colleges and Programs section of this catalog. Students are urged to consult their advisor regarding requirements.

The following restrictions and additions apply to college breadth requirements for the Neuroscience major.

For the College of Humanities, Arts, and Social Sciences

Humanities

Foreign language at level 4 or above for the B.A. may be used to fulfill up to 8 units of the Humanities breadth requirement.

Social Sciences

Psychology courses may not be used as part of the Social Sciences breadth requirement if a Biology course is used to meet any part of the Natural Sciences and Mathematics breadth requirement.

Foreign Language

In fulfilling the Foreign Language breadth requirement for both the B.A. and B.S. degrees, a modern language such as Spanish, Russian, Chinese, German, or French must be used.

Natural Sciences and Mathematics

The Neuroscience Core in the Neuroscience major satisfies the Natural Sciences and Mathematics breadth requirement.

For the College of Natural and Agricultural Sciences

Humanities

For the B.S. degree, 16 units instead of 12 units are required to fulfill the Humanities breadth requirement. PHIL 134 and PHIL 137 are recommended.

Social Sciences

For the B.S. degree, 16 units instead of 12 units are required to fulfill the Social Sciences breadth requirement. Psychology courses not required or approved for the Neuroscience major may be used in meeting the Social Sciences breadth requirement.

Foreign Language

In fulfilling the Foreign Language breadth requirement for the B.A. degree, a modern language such as Spanish, Russian, Chinese, German, or French must be used. Further, fourth-quarter level proficiency in one foreign language (not level 2 in two languages) is required.

Natural Sciences and Mathematics

The Neuroscience Core in the Neuroscience major satisfies the Natural Sciences and Mathematics breadth requirement.

Major Requirements

1. Neuroscience Core (71-73 units). Up to 12 units of upper-division life sciences courses (for this major, courses from the departments of Biochemistry, Biology, Cell Biology and Neuroscience, and Entomology) not being used to satisfy the core may be taken prior to completion of the core.
2. Students must complete all required Neuroscience Core courses with a grade of "C-" or better and with a cumulative GPA in the courses of at least 2.0. Grades of "D" or "F" in two required courses, either separate courses or repetitions of the same course, are grounds for discontinuation from the major.
   a) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C (BIOL 002 and BIOL 003 may be substituted for BIOL 005A, BIOL 05LA, and BIOL 005B with advisor's approval.)
   b) PSYC 011 or STAT 004 or STAT 010
   c) MATH 007A or MATH 009A or MATH 09HA; MATH 007B or MATH 009B or MATH 09HB
   d) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC)
   e) CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 008HLB, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC
   f) PHYS 002A, PHYS 002B, PHYS 002C or PHYS 02HA, PHYS 02HB, PHYS 02HC; PHYS 02LA, PHYS 02LB, PHYS 02LC or PHYS 02HLA, PHYS 02HLB, PHYS 02HLC; or PHYS 040A, PHYS 040B, PHYS 040C or PHYS 040HA, PHYS 040HB, PHYS 040HC
   g) BCH 100 or BCH 110A, or BCH 100H or BCH 110HA
3. Upper-division requirements

   Students must complete all required First Tier and Second Tier courses with a grade of "C-" or better and with a cumulative GPA in the courses of at least 2.0. Grades of "D" or "F" in two required courses, either separate courses or repetitions of the same course, are grounds for discontinuation from the major.

   a) First Tier (16 units)
      (1) CBNS 106
      (2) CBNS 120/PSYC 120
      (3) CBNS 120L/PSYC 120L or PSYC 122L or CBNS 130L/PSYC 123L
      (4) CBNS 124/PSYC 124
   b) Second Tier (at least 12 units for the B.A. or at least 20 units for the B.S.)

      BIOL 178; CBNS 101, CBNS 116, CBNS 121/PSYC 121, PSYC 122, CBNS 125/PSYC 125, CBNS 126/PSYC 126, CBNS 127/PSYC 127; CBNS 129, PSYC 112, PSYC 117, PSYC 129, PSYC 136
   c) Third Tier (additional units to reach a total of 38 units for the B.A. or 46 units for the B.S.) Select from upper-division courses listed under Neuroscience Core, Second Tier above not used to satisfy those requirements, and the additional courses listed below. The combined number of units taken under First Tier, Second Tier, and Third Tier

must total either 38 if the B.A. is sought or 46 if the B.S. is sought.

BCH 110B, BCH 110C, BCH 120; BIOL 100/ENTM 100, BIOL 102, BIOL 105, BIOL 107A, BIOL 108, BIOL 110, BIOL 151, BIOL 160, BIOL 161A, BIOL 161B; BIOL 162/ENTM 162; BIOL 171A, BIOL 171B, BIOL 171C, BIOL 173/ENTM 173, BIOL 175, CBNS 108, CBNS 150/ENTX 150, CBNS 165, CBNS 169; up to 9 units from CBNS 194, CBNS 197 and/or CBNS 199; CS 170; PHYS 139L; PSYC 115, PSYC 130, PSYC 132, PSYC 134, PSYC 135

Note

No courses other than those listed may be used in the major unless specifically approved by the program chair or the program chair's designate.

Sample Program

Bachelor of Arts

Freshman Year	Fall	Winter	Spring
CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC	4,1	4,1	4,1
BIOL 005A, BIOL 05LA; or BIOL 020, BIOL 005B		3,1	4
ENGL 001A, ENGL 001B, ENGL 001C	4	4	4
MATH 007A or MATH 009A; MATH 007B or MATH 009B	4	4	
Humanities/Social Sciences			4
Total Units	**13**	**17**	**17**
Sophomore Year	**Fall**	**Winter**	**Spring**
CHEM 008A and CHEM 008LA, CHEM 008B and CHEM 008LB, CHEM 008C and CHEM 008LC	3,1	3,1	3,1
BIOL 005C	4		
CBNS 106	4		
PSYC 001, PSYC 002		4	4
General Physics	4	4	4
General Physics Lab	1	1	1
Foreign Language	1, 2	4	4
Total Units	**17**	**17**	**17**
Junior Year	**Fall**	**Winter**	**Spring**
BCH 100 or BCH 110A	4		
PSYC 011	5		
Upper-division BIOL, CBNS, or PSYC	4	8	8
Foreign Language	3, 4	4	4
Humanities/Social Sciences		4	4
Total Units	**17**	**16**	**12**
Senior Year	**Fall**	**Winter**	**Spring**
Upper-division BIOL, CBNS, or PSYC	4	4	4
Humanities/Social Sciences	8	4	4
Electives	4	8	8
Total Units	**16**	**16**	**16**

Bachelor of Science

Freshman Year	Fall	Winter	Spring
CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC	4,1	4,1	4,1
MATH 007A or MATH 009A; MATH 007B or MATH 009B	4	4	
BIOL 005A, BIOL 05LA; or BIOL 020 BIOL 005B		3,1	4
ENGL 001A, ENGL 001B, ENGL 001C	4	4	4
Humanities/Social Sciences			4
Total Units	**13**	**17**	**17**
Sophomore Year	**Fall**	**Winter**	**Spring**
CHEM 008A and CHEM 008LA, CHEM 008B and CHEM 008LB, CHEM 008C and CHEM 008LC	3,1	3,1	3,1
BIOL 005C	4		
CBNS 106	4		
PSYC 001, PSYC 002		4	4
General Physics	4	4	4
General Physics Lab	1	1	1
Humanities/Social Sciences		4	4
Total Units	**17**	**17**	**17**
Junior Year	**Fall**	**Winter**	**Spring**
BCH 100 or BCH 110A	4		
PSYC 011	5		
Upper-division BIOL, CBNS, or PSYC	4	8	8
Humanities/Social Sciences	4	8	4
Total Units	**17**	**16**	**12**
Senior Year	**Fall**	**Winter**	**Spring**
Upper-division BIOL, CBNS, or PSYC	8	8	8
Electives	4	8	8
Total Units	**12**	**16**	**16**

Minor

A minor in Neuroscience is available. For more information on minor requirements, refer to the discussion of minors in the appropriate college section of the General Catalog.

1. First Tier (16 units)
   a) CBNS 106 with a grade of C- or better
   b) CBNS 120/PSYC 120
   c) CBNS 120L/PSYC 120L or PSYC 122L or CBNS 130L/PSYC 123L
   d) CBNS 124/PSYC 124
2. Second Tier (6 units)

   Select additional units from the list below so that the units from the First Tier combined with the units from the Second Tier equal at least 20.

   BIOL 178; CBNS 101, CBNS 116, CBNS 121/PSYC 121, PSYC 122, CBNS 125/PSYC 125, CBNS 126/PSYC 126, CBNS 127/PSYC 127; PSYC 112, PSYC 117, PSYC 129

Descriptions for all courses used in the Neuroscience major and minor may be found in the appropriate department section.

Neuroscience Graduate Program

Subject abbreviation: NRSC
College of Natural and Agricultural Sciences

Viji Santhakumar, Ph.D., Director
Program Office, 1140 Batchelor Hall
(800) 735-0717
neuro.ucr.edu

Professors

Michael E. Adams, Ph.D. (Molecular, Cell and Systems Biology, Entomology)
Devin Binder, M.D. Ph.D. (Biomedical Sciences)
Monica J. Carson, Ph.D. (Biomedical Sciences)
Djurdjica Coss, Ph.D. (Biomedical Sciences)
Margarita C. Currás-Collazo, Ph.D. (Molecular, Cell and Systems Biology)
Anupama Dahanukar, Ph.D. (Molecular, Cell and Systems Biology)
Nicholas V. DiPatrizio, Ph.D. (Biomedical Sciences)
Iryna M. Ethell, Ph.D. (Biomedical Sciences)
Martin I. Garcia-Castro, Ph.D. (Biomedical Sciences)
Theodore Garland, Jr., Ph.D. (Evolution, Ecology, and Organismal Biology), *Distinguished Professor of Evolution, Ecology, and Organismal Biology*
Xiaoping Hu, Ph.D. (Bioengineering)
Kelly J. Huffman, Ph.D. (Psychology)
Ryan Julian, Ph.D. (Chemistry)
Marcus Kaul, Ph.D. (Biomedical Sciences)
Manuela Martins-Green, Ph.D. (Molecular, Cell and Systems Biology)
Anandasankar Ray, Ph.D. (Molecular, Cell and Systems Biology)
Khaleel Razak, Ph.D. (Psychology)
Wendy G. Saltzman, Ph.D. (Evolution, Ecology, and Organismal Biology)
Viji Santhakumar, Ph.D. (Molecular, Cell and Systems Biology)
Seema Tiwari-Woodruff, Ph.D. (Biomedical

Sciences)
Yinsheng Wang, Ph.D. (Chemistry)
Emma Wilson, Ph.D. (Biomedical Sciences)
Naoki Yamanaka, Ph.D. (Entomology)
Sika Zheng, Ph.D. (Biomedical Sciences)

Associate Professors

Ilana Bennett, Ph.D. (Psychology)
Polly Campbell, Ph.D. (Evolution, Ecology, and Organismal Biology)
Jun-Hyeong Cho, Ph.D. (Molecular, Cell and Systems Biology)
Scott N. Currie, Ph.D. (Molecular, Cell and Systems Biology)
Todd Fiacco, Ph.D. (Molecular, Cell and Systems Biology)
Peter W. Hickmott, Ph.D. (Psychology)
Edward Korzus, Ph.D. (Psychology)
Kalina Michalska, Ph.D. (Psychology)
Martin Riccomagno, Ph.D. (Molecular, Cell and Systems Biology)
Rachel Wu, Ph.D. (Psychology)
Hongdian Yang, Ph.D. (Molecular, Cell and Systems Biology)
Edward Zagha, Ph.D. (Psychology)
Weiwei Zhang, Ph.D. (Psychology)

Assistant Professors

Garret Anderson, Ph.D. (Molecular, Cell and Systems Biology)
Ian Ballard, Ph.D. (Psychology)
Sihem Cheloufi, Ph.D. (Biochemistry)
Halle Dimsdale-Zucker, Ph.D. (Psychology)
Regin Firat, Ph.D. (Sociology)
Ysabel Giraldo, Ph.D. (Entomology)
Anubhuti Goel, Ph.D. (Psychology)
Sachiko Haga-Yamanaka, Ph.D. (Molecular, Cell and Systems Biology)
Jean-Pyo Lee, Ph.D. (Biomedical Sciences)
Katherine Meltzoff, Ph.D. (Graduate School of Education)
Jernej Murn, Ph.D. (Biochemistry)
Christopoulous Vasileios, Ph.D. (Bioengineering)
Natalie Zlebnik, Ph.D. (Biomedical Sciences)

**

Adjunct Professor

Shu-Wei (Richard) Sun, Ph.D.

Graduate Program

The multidisciplinary interdepartmental graduate program in Neuroscience offers instruction and research training leading to the Ph.D. degree in Neuroscience. A Thesis Plan (Plan I) or Non-Thesis Plan (Plan II) M.S. degree in Neuroscience is available under special circumstances, when the work leading to the Ph.D. degree cannot be completed. Whether either of these options is appropriate will be decided by the student's Guidance Committee typically either at the end of the first year, or at the time of the qualifying examination. See General University requirements for Plan I and Plan II M.S. degrees: **graduate.ucr.edu/programs**.

The goal of this program is to prepare students for careers in research, teaching, industry, and scientific administration. The program is aimed at providing high-quality graduate training for students who come from a variety of undergraduate backgrounds, but share a commitment and an intense interest in nervous system research. Students are expected to learn the fundamentals of neuroscience, starting with the required core sequence, become knowledgeable concerning a range of research methods as taught in neuroscience laboratories and demonstrate capability in original research. Graduate student training reflects the research competence and specialties of the faculty. That is, the specific research training received by a graduate student is the responsibility of the major professor/mentor in whose laboratory the student carries out the research projects leading to the degree. Students benefit from an interdisciplinary training approach, tailored by the major advisor but enriched by the readily available expertise and laboratory facilities of program faculty with backgrounds ranging from chemistry to psychology.

Current UCR Neuroscience faculty have major appointments in several different departments but have a considerable degree of common interest in research problems and techniques. Furthermore, the three chief levels of analysis at which nervous systems are currently studied (molecular/cellular, systems, and behavioral) are more or less evenly represented by the interests and expertise of the faculty. Some faculty, as may be expected, carry out research programs that combine two or more of these levels of analysis. These levels of analysis, which characterize the faculty's research, indicate the breadth of integrated neuroscience at UCR but do not represent "fields of emphasis" in which students are to be trained.

Areas that faculty investigate include the following:

- Glial-Neuronal Interactions
- Physiological actions of ion channel toxins
- Modulation of ion channels by neurotransmitters and hormones
- Auditory processing
- Synaptic transmission and neural plasticity in mammalian nervous systems
- Signal transduction in excitable cells
- Sensory and perceptual processes
- Molecular biology of ion channel structure and function
- Receptor–channel interactions
- Synaptic and non-synaptic mechanisms in neuroendocrine systems
- Plasticity in adult central nervous system
- Neurodevelopment
- Neuroinflammation
- Neurodegeneration
- Gut-brain interactions
- Neurotoxicology
- Neurogenetics
- Addiction
- Behavior genetics
- CNS-Immune system interactions

Areas involving behaviors and diseases include the following:

- Roles of glial cells in neurological disease
- Neural control of eating, locomotory, and social behaviors
- Neuroendocrine regulation of innate and social behaviors
- Neural basis of language and reading
- Neural networks controlling locomotion in the spinal cord and brainstem
- Auditory function in Fragile X Syndrome and age-related hearing loss
- Neurolinguistics
- Individual differences in cortical anatomy and relation to behavior
- Learning and memory
- Mechanisms of neuronal death in Alzheimer's disease, stroke, and other disorders

Admission

Applicants must meet the general admissions requirements of the Riverside Division of the Academic Senate and the UCR Graduate Council as set forth in the Graduate Studies section of this catalog, including completion of an undergraduate degree (B.S. or B.A.). Applicants to the M.S. and Ph.D. program may submit GRE General Test scores (verbal, quantitative, and analytical), but it is not a requirement. They should have an adequate background in biological, behavioral and physical sciences; ideally including courses in the following or equivalent areas: General Biology, Genetics, General Chemistry, Biochemistry, Organic Chemistry, Physics, Calculus, and Statistics. Additionally, at least 20 quarter-units of courses distributed among the following areas are required, although applicants may be admitted with limited course work deficiencies and required to make up deficiencies as specified by the admissions committee: Biochemistry; Cell Biology; Molecular Biology; Physiology; Neuroimmunology, Animal Behavior; Learning and Memory; Perception; Computer Science; and Neuroscience, Neurobiology, or Physiological Psychology, with laboratory.

Doctoral Degree

Course Work

Core requirements include:

1. NRSC 200A/PSYC 200A (Cell/Molecular Neuroscience)

   NRSC 200B/PSYC 200B (Systems Neuroscience)

   NRSC 200C/PSYC 200C (Behavioral Neuroscience)

   NRSC 202 (Advanced Methods in Neuroscience)

2. One elective course selected by the student in consultation with the major professor and/or guidance committee. Elective choices are flexible and meant to enhance and strengthen the student's expertise in the research area of interest and with attention given to ultimate career goals. Given the interdisciplinary nature of Neuroscience, courses may be chosen from any program or department. Graduate courses are preferred; undergraduate courses may be used only with approval of the Graduate Advisor (or Program Director). Elective courses should be substantial, although unit requirements are flexible. A course in statistics relevant to the area of research is strongly recommended.

3. During each quarter in academic residence every student enrolls and participates in the Colloquium in Neuroscience (NRSC 287/PSYC 287), and, until passing the oral qualifying examination, every student

enrolls in two seminars, Special Topics in Neuroscience (NRSC 289, 2 units), during each year of academic residence. One seminar (NRSC 289) per year is required after the qualifying examination is passed.

4. After completing the course requirements and no later than the ninth quarter in residence, the student is given a two-part qualifying examination, one written and one oral. The oral qualifying exam may be done in person or hybrid (at the discretion of the exam chair). The chairperson and the student must be in person. A minimum of three committee members including the chairperson must be in person. A maximum of two committee members (not including the chairperson) may be online. Student is responsible for ensuring technology is set up regardless of exam modality. Non-UCR external members may be in person or remote. (Staff does not need to be present to assist the student.)
5. Regardless of whether financial support comes from fellowships or research assistantships, etc., students must be teaching assistants for at least two quarters in Neuroscience or related-area courses, such as those taught by their mentors.
6. Within three months of advancement to candidacy, the student must submit a written dissertation proposal to the dissertation committee for comments and approval. Before the dissertation is given final approval, the student must present a public lecture on the dissertation research to faculty and students in the program. Following the public lecture, the student meets with the dissertation committee for an oral defense in accordance with the regulations of the Graduate Division. The final defense may be done in person or hybrid (at the discretion of the exam chair). The chairperson and the student must be in person. A minimum of two committee members including the chairperson must be in person. Only one committee member (not the chairperson) may be online. Student is responsible for ensuring technology is set up regardless of exam modality. Non-UCR external members may be in person or remote. (Staff does not need to be present to assist the student.)

Professional Development

Graduate students fulfill their professional development training requirements through Teaching Assistantships, Graduate Student Research, and enrollment in NRSC 200 (A, B, and C), 287, 289, 297, 299. Skills developed throughout the program include public speaking; grant and professional writing; research training; responsible conduct of research; pedagogy; scientific interactions and intellectual development; safety training; and community outreach.

Normative Time to Degree

16 quarters

Graduate Courses

NRSC 200A Fundamentals of Neuroscience 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with PSYC 200A.

NRSC 200B Fundamentals of Neuroscience 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor; NRSC 200A/PSYC 200A. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with PSYC 200B.

NRSC 200C Fundamentals of Neuroscience 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor; NRSC 200B/PSYC 200B. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with PSYC 200C.

NRSC 202 Advanced Methods in Neuroscience 3 Lecture, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers topics on a variety of advanced methods in neuroscience research including molecular, genetic, anatomical, physiological, and behavioral approaches. Provides a deeper understanding of experimental approaches related to thesis research as well as other studies in the literature. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

NRSC 280 Neuromodulation of Behavior 3 Lecture, 3 hours. Prerequisite(s):NRSC 200A or PSYC 200A; NRSC 200B or PSYC 200B; graduate standing; or consent of instructor. Explores the roles of specific brain circuits such as neuromodulatory systems and other subcortical areas in modulating animal behavior.

NRSC 287 Colloquium in Neuroscience 1 Colloquium, 1 hour. Prerequisite(s): restricted to major(s) Neuroscience, Psychology; graduate standing; or consent of instructor. Involves oral presentations on current research topics in neuroscience by visiting scholars, faculty, and students. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with PSYC 287.

NRSC 289 Special Topics in Neuroscience 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussion of selected topics in neuroscience. Content and instructor(s) vary each time course is offered. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. course is repeatable. Cross-listed with BCH 289, BIOL 289, CHEM 289, ENTM 289, and PSYC 289.

NRSC 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Individual study, directed by a faculty member, of specially selected topics in neuroscience. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

NRSC 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Research and experimental studies conducted under the supervision of a faculty member on specially selected topics in neuroscience. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

NRSC 299 Research For the Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing; consent of instructor. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.



Peace and Conflict Studies Minor

Subject abbreviation: PCST
College of Humanities, Arts, and Social Sciences

(In Moratorium)

The Peace and Conflict Studies minor is not currently accepting new students. For more information, contact CHASS Student Academic Affairs, 3400 Humanities and Social Sciences Building, (951) 827-3683.

Juliann Emmons Allison, Ph.D., Co-Chair
(951) 827-5524; juliann.allison@ucr.edu
Erith Jaffe-Berg, Ph.D., Co-Chair
(951) 827-4418; erith.jaffe-berg@ucr.edu
Advising Office, CHASS INTS 3rd Floor
MDU Academic Advising Center Lobby

Committee in Charge

Juliann Allison, Co-Chair
(Gender & Sexuality Studies)
Erith Jaffe-Berg, Co-Chair (Theatre)
Rickerby Hinds (Theatre)
Bronwyn Leebaw (Political Science)
Daryle Williams, Dean, *ex officio*

Administered through the Interdisciplinary Studies Office, the Peace and Conflict Studies Minor provides opportunities for undergraduate students to give sustained attention to the diverse origins and expressions of conflict, to models for resolution advised by scholars and practitioners, to proactive peacemaking through the investigative and creative strategies fostered in higher education.

Students must take 5 upper-division courses as specified in sections 1 and 2 below.

1. **Students must take at least one course from each of the following three rubrics plus a fourth course from the list below from any rubric:**
   a) Perspectives from Religion, Philosophy, Literature and the Arts CLA 141/AST 145/CHN 141/CPAC 141/POSC 140, CPLT 115/GER 163/HISE 163/MCS 115, CPLT 132/FREN 132/GER 132, CPLT 134/GER 134/JPN 134/MCS 114, ENGL 135, RLST 116, RLST 174, RLST 175, RLST 176, THEA 191 (E-Z), VNM 162/AST 162/HIST 187/SEAS 162
   b) Social Scientific Perspectives ETST 111, POSC 123, POSC 124, POSC 124S, POSC 129, POSC 142L, POSC 150, POSC 159, POSC 160, POSC 169, SOC 122
   c) Historical Perspectives HISA 114, HISA 135/ETST 112, HISA 162/LNST 172, HISA 165, HISA 166, HISE 145, HISE 146, HIST 184/AST 160/SEAS 184/VNM 184, MCS 173 (E-Z)/CPLT 173 (E-Z), POSC 125, POSC 162/LNST 142
2. **Capstone Course; one of the following:** PCST 190, PCST 197, PCST 198-I

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Upper-Division Courses

PCST 190 Special Studies 1 to 5 Consultation, 10 hours per quarter; extra reading, 6 to 9 hours; written work, 3 to 6 hours. Prerequisite(s): upper-division standing; consent of Peace and Conflict Studies Committee chair; consent of faculty advisor is required for students repeating the course. Individual study in the areas of conflict resolution and mediation. Examines theories in depth, as well as case studies introduced in previous courses.

PCST 197 Research For Undergraduates 4 Consultation, 10 hours per quarter; extra reading, 6 hours; written work, 3 hours. Prerequisite(s): upper-division standing; consent of Peace and Conflict Studies Committee chair. Directed original research in the fields of conflict resolution, mediation, and peace studies.

PCST 198I Individual Internship in Peace and Conflict Studies 4 Consultation, 1 hour; internship, 8 hours; written work, 3 hours. Prerequisite(s): upper-division standing; consent of Peace and Conflict Studies Committee chair; consent of faculty advisor is required for students repeating the course. Provides internship opportunities in organizations that engage in mediation and conflict resolution. Includes supervision under an assigned faculty member. Course is repeatable up to 16 units.

Pest Management

Subject Abbreviation: PSMT
College of Natural and Agricultural Sciences

The M.S. program in Pest Management is not currently accepting new students. For further information call (800) 735-0717 or (951) 827-5621.

Philosophy

Subject abbreviation: PHIL
College of Humanities, Arts, and Social Sciences

Michael Nelson, Ph.D., Chair
Department Office, 1606 Humanities and Social Sciences
(951) 827-3760; philosophy.ucr.edu

Professors

Luca Ferrero, Ph.D.
John M. Fischer, Ph.D., *Distinguished Professor*
Peter J. Graham, Ph.D.
Agnieszka Jaworska, Ph.D.
Barry Lam, Ph.D.
Andrews Reath, Ph.D.
Erich Reck, Ph.D.
Eric Schwitzgebel, Ph.D.
Howard K. Wettstein, Ph.D.

Professors Emeriti

Maudemarie Clark, Ph.D., *Distinguished Professor*
Carl F. Cranor, Ph.D., *Distinguished Professor*
David K. Glidden, Ph.D.
John Perry, Ph.D., *Distinguished Professor*
Gary Watson, Ph.D.
Larry Wright, Ph.D.

Associate Professors

Myisha Cherry, Ph.D.
Adam Harmer, Ph.D.
Coleen Macnamara, Ph.D.
Jozef Müller, Ph.D.
Michael Nelson, Ph.D.
Alexandra Newton, Ph.D.

Assistant Professors

Kim Frost, Ph.D.
Dylan Shaul, Ph.D.

Majors

The Department of Philosophy offers a major and minor in Philosophy and a major in Philosophy/Law and Society.

The **Philosophy major** is designed to introduce students to the important issues and arguments surrounding such subjects as morality, knowledge, the nature of the mind and of the physical world, science, and language. The program provides a rigorous background in the history of Western philosophy, and studies contemporary approaches (both analytic and Continental) to philosophical issues. The B.A. degree in Philosophy prepares students for graduate study in philosophy, and is also excellent preparation for law school. For students interested in a double major, philosophy also serves as an excellent complement to psychology, mathematics, political science, and the natural sciences.

The **Philosophy/Law and Society** major is open to undergraduate students with junior standing who have completed LWSO 100 with a grade of "C" or higher. The major offers students a means of understanding complex relationships between social institutions and provides a strong basis for graduate studies in areas related to law and philosophy. The Philosophy/Law and Society curriculum is sound background for students planning on pursuing the study of law.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The department offers two majors: the traditional Philosophy major, and a Philosophy/Law and Society major.

Philosophy Major

The major requirements for the B.A. degree in Philosophy are as follows:

Fifty-six (56) units of course work in Philosophy including at least 36 upper-division units.

1. **PHIL 007 or PHIL 007H and PHIL 008 or PHIL 008H**
2. **PHIL 100 or PHIL 101 (Sophomore-Junior Seminar)**
3. **Three courses in the history of philosophy, at least one of which must be in ancient Greek or Roman philosophy.** Select courses from PHIL 030 (E-Z), PHIL 120 (E-Z), PHIL 121 (E-Z), PHIL 122 (E-Z); a specific list is provided by the Philosophy Department. Not more than two courses may be from PHIL 030 (E-Z)

4. **At least two courses in metaphysics, epistemology, or philosophy of language:** PHIL 130 through PHIL 152, PHIL 159.
5. **At least one course in moral and political philosophy:** PHIL 108, PHIL 116, PHIL 117, PHIL 119, PHIL 153, PHIL 161 through PHIL 169 (E-Z).

Students are urged to consult the department's undergraduate advisor in preparing their course of study each quarter while at UCR.

Philosophy/Law and Society Major

Major requirements for a B.A. degree in Philosophy/Law and Society are as follows:

1. **Philosophy requirements (36 units)**
   a) PHIL 007 or PHIL 007H
   b) Three courses in the history of philosophy (two of which must be upper-division): PHIL 030 (E-Z), PHIL 120 (E-Z), PHIL 121 (E-Z), PHIL 122 (E-Z)
   c) Five courses in moral and political philosophy: PHIL 108, PHIL 116, PHIL 117, PHIL 119, PHIL 153, and PHIL 161 through PHIL 169 (E-Z)
2. **Law and Society requirements (36 units)**
   a) PHIL 007 or PHIL 007H
   b) LWSO 100 (with a grade of "C" or better)
   c) One course chosen from POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
   d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
   e) Two courses chosen from HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180
   f) LWSO 193, Senior Seminar

Note: For sections 2.d) and 2.e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (Philosophy Department requirements and Law and Society requirements). The department has its own Philosophy/Law and Society undergraduate advisor, and each student is urged to consult the advisor in preparing a course of study each quarter while at UCR.

Minor

A student may minor (24 units) in Philosophy by taking either PHIL 007, PHIL 007H, PHIL 008 or PHIL 008H, four upper-division philosophy courses, and one other philosophy course at any level.

Students may also choose to do a Philosophy minor with special emphasis, taking their four upper-division courses from one of the areas listed below:

1. **Philosophy, Literature, and History of Philosophy:** PHIL 120 (E-Z), PHIL 121 (E-Z), PHIL 122 (E-Z), PHIL 132, PHIL 151, PHIL 152, PHIL 150, PHIL 159
2. **Philosophy and Cognitive Science:** PHIL 125, PHIL 126, PHIL 130, PHIL 131, PHIL 132, PHIL 133, PHIL 134, PHIL 135
3. **Philosophy and the Natural Sciences:** PHIL 117, PHIL 130, PHIL 134, PHIL 137, PHIL 140, PHIL 151, PHIL 167
4. **Philosophy and Social and Policy Analysis:** PHIL 153, PHIL 161, PHIL 162, PHIL 163, PHIL 164, PHIL 165

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Track for Distinction in Philosophy

The undergraduate track for Distinction in Philosophy is designed to give qualified upper division students the opportunity to do additional upper division work in Philosophy in a seminar format beyond what is required for the major. It will give students the opportunity and the training to do independent research in Philosophy.

Each Philosophy major in the track for Distinction in Philosophy will be assigned a faculty mentor upon entering the program. Faculty are encouraged to provide more challenging assignments to these students in their upper-division classes (such as term papers, revision of a paper in response to feedback, etc.).

Philosophy students who successfully complete this program are awarded and have posted on their transcript the designation Distinction in Philosophy.

Complete details and an application form are available from the Philosophy Student Affairs Officer.

Prerequisites for the track for Distinction in Philosophy

1. Submission of an application during the last quarter of the sophomore year or during the junior year (no later than the last quarter of the junior year).
2. Completion of 90 units (junior standing).
3. Completion of PHIL 7, PHIL 8, PHIL 100/101, and 2 upper-division courses in Philosophy. Students are encouraged to take the 2 courses in the PHIL 30 series (see below) as early in their major as possible.
4. Cumulative GPA of 3.5 in Philosophy

These pre-requisites can be waived by permission of the Department under exceptional circumstances. Inquiries may be directed to the Philosophy Student Affairs Officer.

Requirements for the track for Distinction in Philosophy

This track adds some requirements to the Philosophy major:

1. 64 units in Philosophy, of which 48 units must be upper division. (The major requires 56 units, of which 36 units must be upper division.)
2. 2 courses in the PHIL 30 series. (These courses count toward the 64 units and the three courses in the History of Philosophy.)
3. 2 quarters of either PHIL 193 OR PHIL 193 and PHIL 195 (8 units total). Students in the University Honors Program may substitute 4 units of HNPG 199H for 4 units of Phil 195. (These courses count towards the 64 units. With Department approval, PHIL 193 and PHIL 195 may be applied toward the History of Philosophy, Metaphysics/Epistemology/Philosophy of Language, or Moral/Political Philosophy requirements.)
4. To receive Distinction in Philosophy, students must have a cumulative GPA of 3.5 in Philosophy upon completion of the program.

Graduate Program

The Department of Philosophy offers the M.A. and Ph.D. degrees in Philosophy.

Admission

All applicants to this program must have completed a bachelor's degree or its approved equivalent from an accredited institution and have attained an undergraduate record that satisfies the standards established by the Graduate Division and University Graduate Council. Applications are accepted for the Fall quarter only. We do not accept terminal MA students. Applicants whose first language is not English are required to submit acceptable scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) unless they have a degree from an institution where English is the exclusive language of instruction. Additionally each applicant must submit a writing sample and three letters of recommendation, at least two of which must be academic references. All other application requirements are specified in the graduate application.

Upon entering the program, a student is assigned a faculty mentor who consults with the student each quarter to discuss the student's individual course of study, progress in the program, and recent performance. Students also consult the Graduate Adviser regularly to discuss their course of study and progress in the program. In the first year, students (whether they have entered with an M.A. or a B.A.) take three proseminars for first-year graduate students, two in Metaphysics and Epistemology, and one in Moral Philosophy (PHIL 275A, PHIL 275B, PHIL 275C). The proseminars are designed to acquaint first-year students with the current state of discussion in central areas of contemporary philosophy and to impart the skills needed to conduct their own research.

Master's Degree

The Department of Philosophy offers the M.A. degree in Philosophy under Plan II (M.A. Paper).

Course Work

Students must complete, with a grade of "B" or better, course work totaling 48 units of graduate credit in philosophy. Of these, 4 units must be from either 275A or 275B and 4 units from PHIL 275C, and an additional 24 units must be taken from PHIL 272A-B-C, 280-283, 284A-B or 285A-B. Up to 16 units may be drawn from PHIL 125, PHIL 220-229, PHIL 242-249, PHIL 253, PHIL 290 or PHIL 292 paired with a 100-level course, depending on the student's interests and background. These courses are to be chosen

only in consultation with the student's advisory committee and the graduate advisor.

Courses taken on a Satisfactory (S)/No Credit (NC) basis cannot be used to satisfy course requirements.

Students should note that although they need not complete distributional requirements or an outside competency requirement to acquire the M.A. degree, there are strict distributional and outside competency requirements for the Ph.D. degree, as well as a colloquium and professional development workshop requirement (described below under the Ph.D requirements). Students who expect to continue on in the Ph.D. program must begin to fulfill these requirements immediately upon entering the program if they expect to acquire the Ph.D. degree within the prescribed period of time.

M.A. Logic Requirement
The logic requirement for the M.A. degree is completion of PHIL 124 with a grade of "B" or better. Students may be excused from this requirement if they show sufficient knowledge of logic upon entering the graduate program, as indicated by an optional diagnostic examination administered at the start of each academic year. Students who are unsure about the adequacy of their background are encouraged to take the test for diagnostic purposes.

M.A. Paper
Students select a paper to submit to the graduate advisor as their M.A. paper no later than the end of the spring quarter of their second year. M.A. papers can be seminar papers, revised seminar papers, or any other paper that the student has written (of 25 pages or less). Further information on what constitutes an acceptable paper is available in the graduate student handbook.

Upon the submission of this paper, the graduate advisor selects three faculty members to serve as the M.A. committee, which conducts an oral examination on the paper. Normally the oral examination will be completed before the end of the student's second year, but it may be postponed until the fall quarter of the student's third year. Failure to pass the M.A. oral examination after two opportunities constitutes grounds for dismissal from the program. In addition, completion of the M.A. requirements does not guarantee permission to continue in the Ph.D. program.

Doctoral Degree

The Department of Philosophy offers the Ph.D. degree in Philosophy.

Admission
Students are invited to continue toward candidacy for the Ph.D. degree on the basis of performance in courses and seminars, satisfactory completion of the M.A. requirements, and the recommendation of the graduate advisor. A student's course of study is supervised by the student's faculty mentor, in consultation with the graduate advisor until the student's dissertation committee is appointed. Students with a master's degree in Philosophy from other universities are eligible for admission. These students must enroll in the first-year proseminars.

Course Work
Students must complete 12 more units in philosophy, with a grade of "B" or better, in addition to the 48 units for the M.A. degree. With the graduate advisor's approval, 4 of these units may be satisfied by fulfillment of the outside competency requirement only when this requirement is satisfied by mastery of a newly acquired language other than English that is needed for one's dissertation project. Of the student's 60 letter- graded graduate units in philosophy, 12 units must be in the area of the history of philosophy, with 4 of these in ancient philosophy, 4 units in addition to the proseminar (PHIL 275A or PHIL 275B) in the area of metaphysics and epistemology, and 8 units in addition to the proseminar (PHIL 275C) in the area of ethics, political philosophy, and aesthetics. Courses that fulfill the History of Philosophy distribution requirement are PHIL 282 and 284 A-B. Depending on the course syllabus PHIL 272 A-B-C, 280, 281, and 290 may fulfill the History of Philosophy distribution requirement. Depending on the course syllabus PHIL 272 A-B-C, 280-282, 284 A-B, and 290 may fulfill the Ancient Philosophy distribution requirement. Depending on the course syllabus all graduate level courses except Phil 291 and 292 may fulfill the Metaphysics and Epistemology distribution requirement. Depending on the course syllabus all graduate level courses except 291 and 292 may fulfill the Ethics, Political Philosophy, and Aesthetics distribution requirement.

Forty of these 60 letter- graded units must be seminars and workshops taken from PHIL 272A-B-C, 275A-B-C, 276, 280-283, 284A-B or 285A-B. (Only 4 letter-graded units of PHIL 276 count towards the 60 letter- graded units of the PhD course requirements.) Up to 20 units may be drawn from PHIL 125 or PHIL 290-292. Students are required to enroll in PHIL 276 three times during their third and fourth years, with the default schedule being twice in the third year and once in the fourth year, although students can petition the graduate advisor for a different schedule if it better suits their advancement through the requirements. One quarter of PHIL 276 must be taken for 4 units on a letter- graded basis. (Students who have advanced to candidacy by the first day of classes of the spring quarter of their fourth year are exempted from a third quarter of PHIL 276.) Seminars from other UC Philosophy Departments via Intercampus Exchange count toward the Ph.D. course and seminar requirements. Graduate seminars in other disciplines (either at UCR or via Intercampus Exchange at another UC campus) may count toward the Ph.D. course and seminar requirements by petition to the Graduate Advisor. Students are in addition expected to take one seminar or workshop each quarter until they advance to candidacy (taken from PHIL 272A-B-C, 275A-B-C, 276, 280-283, 284A-B or 285A-B.) Students can petition the graduate advisor for exemptions from this requirement .

Colloquia and Professional Development Workshop Requirement
Students must register for the PHIL 270 (Philosophy Colloquia) during each quarter of their first and second years. Students must register for PHIL 400 (Research and Professional Development Workshop) during each quarter of their second and third years.

Outside Competency Requirement
Students must show a competence in an area outside of philosophy relevant to their proposed dissertation topic. This can include competence in a technical area in statistics, psychology, neuroscience, physics, etc., demonstrated by earning a grade of B or higher in a graduate level course in another department as approved by the graduate advisor. For students whose dissertation topic primarily concerns texts in a language other than English, the competency requirement must be completed by demonstrating mastery of that language by passing a translation exam administered by the department.

Logic Requirement
Students must pass PHIL 125 (Intermediate Logic) with a grade of "B" or better.

Third-Year Paper Requirement
By the start of the Fall term of their third year, students must have a Third-Year advisor, reported to the graduate advisor. In consultation with their advisors, students should construct a bibliography on a proposed area of research. By the end of the Winter term of their third year (exceptions on time line can be made on graduate advisor's discretion in consultation with the advisor), students must complete an acceptable Third-Year Paper, approved by a committee of three faculty members of the philosophy department including the Third-Year advisor. The default expectation is the Third-Year Paper consists of a bibliography and a literature review of the area and works listed on that bibliography. (While there is an expectation that the reviewed area of research will remain the same through the prospectus and dissertation, this is not required.) There is also an option to write a 25-page original research paper in lieu of a literature review essay, in consultation with the Third-Year advisor and graduate advisor.

Written and Oral Qualifying Examinations
Students must write a dissertation prospectus and pass a qualifying oral examination before advancing to candidacy, by the end of the Spring quarter of the fourth year (exceptions can be made at the graduate advisor's discretion in consultation with the prospectus advisor). This examination, which is supervised by a faculty committee as stipulated in the regulations of the Graduate Division, concentrates on the students' preparation for writing a dissertation as indicated by the dissertation prospectus. It must be taken after the student has passed the M.A., language, and proposition requirements and normally occurs within two quarters of the completion of these requirements.

The Oral Qualifying Exam can be taken in one of the following modes: In-Person, Hybrid, or Remote. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. In-Person exams will take place on campus unless the advisor in consultation with their student decides on another location. The student and all committee members must be physically present for In-Person exams. If Hybrid is chosen, the student and

their advisor will discuss who is expected to be in-person and who can be remote, with the advisor making the final determination. Finally, if Remote is chosen, the student and all committee members have the option to attend remotely.

Dissertation and Final Oral Examination
A dissertation to be presented as prescribed by the Graduate Council is prepared under the direction of the candidate's dissertation committee. After completion of the dissertation, the candidate is examined in its defense by the dissertation committee.

The Final Oral Examination can be taken in one of the following modes: In-Person, Hybrid, or Remote. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. In-Person exams will take place on campus unless the advisor in consultation with their student decides on another location. The student and all committee members must be physically present for In-Person exams. If Hybrid is chosen, the student and their advisor will discuss who is expected to be in-person and who can be remote, with the advisor making the final determination. Finally, if Remote is chosen, the student and all committee members have the option to attend remotely.

Normative Time to Degree 18 quarters

Lower-Division Courses

PHIL 001 Introduction to Philosophy 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introductory exploration into the nature of the individual, his/her place in the universe, and the forces that shape his/her destiny. Credit is awarded for one of the following PHIL 001 or PHIL 001H.

PHIL 001H Honors Introduction to Philosophy 4 Lecture, 2 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to PHIL 001. An introductory course designed to explore a small number of classical texts central to philosophy and the liberal arts and sciences. Students examine issues surrounding the nature of knowledge, the foundations of moral philosophy, and the relation of both to the development of the human and natural sciences. Texts may vary from year to year and include works by such authors as Plato, Aristotle, Descartes, Hobbes, Hume, and Kant. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL 001 or PHIL 001H.

PHIL 002 Contemporary Moral Issues 4 Lecture, 3 hours; discussion, 1 hour. A philosophical analysis of contemporary moral issues such as abortion, discrimination, sexual morality, punishment, the obligation to obey the law, suicide, euthanasia, war, and privacy. Credit is awarded for one of the following PHIL 002 or PHIL 002H.

PHIL 002H Honors Contemporary Moral Issues 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to University Honors; or consent of instructor. Honors course corresponding to PHIL 002. A philosophical analysis of contemporary moral issues such as abortion, discrimination, sexual morality, punishment, the obligation to obey the law, suicide, euthanasia, war, and privacy. Credit is awarded for one of the following PHIL 002H or PHIL 002.

PHIL 003 Ethics and the Meaning of Life 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Approaches the basic question of value: how should one live? Covers classical and contemporary discussions of issues such as the human good, human virtue, the role of pleasure and happiness, egoism and altruism, duty, the relativity and objectivity of value, the meaning of life, death, autonomy, integrity, and conscience. Credit is awarded for one of the following PHIL 003, PHIL 003H, PHIL 003W, or PHIL 003X.

PHIL 003H Honors Ethics and the Meaning of Life 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to PHIL 003. Approaches one of the basic questions of value: How should one live? Covers classical and contemporary discussions of issues such as the human good, human virtue, the role of pleasure and happiness, egoism and altruism, duty, the relativity and objectivity of value, the meaning of life, death, autonomy, integrity, and conscience. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X.

PHIL 003W Ethics and the Meaning of Life 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 040F; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; or consent of instructor. Approaches one of the basic questions of value: how should one live? Covers classical and contemporary discussions of issues such as the human good; human virtue; the role of pleasure and happiness; egoism and altruism; duty; the relativity and objectivity of value; the meaning of life; death; autonomy; integrity; and conscience. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to WRIT 030. Credit is awarded for one of the following PHIL 003W, PHIL 003, PHIL 003H, or PHIL 003X.

PHIL 003X Honors Ethics and the Meaning of Life 4 Lecture, 3 hours, discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to University Honors, ENGL 001B with a grade of "C" or better or consent of instructor. Honors course corresponding to PHIL003W. Approaches one of the basic questions of value: how should one live? Covers classical and contemporary discussions of issues such as the human good, human virtue, the role of pleasure and happiness, egoism and altruism, duty, the relativity and objectivity of value, the meaning of life, death, autonomy, integrity, and conscience. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to English 001C. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL003 or PHIL003H or PHIL003W or PHIL003X.

PHIL 004 Introduction to the Philosophy of Race 4 Lecture, 3 hours; discussion, 1 hour; Prerequisite(s): none. Introduction to the philosophy of race from classical theorists to contemporary critical race theory. Topics covered include the Enlightenment, discussions of race in the founding of the American Republic, Supreme Court decisions from Dred Scott to recent affirmative action decisions, and the concept of race as a social construction.

PHIL 005 Evil 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the nature of evil, its motivation, and its origins. Utilizes a variety of sources to examine these themes including classical philosophical texts and contemporary films. Credit is awarded for one of the following PHIL 005 or PHIL 005H.

PHIL 005H Honors Evil 4 Lecture, 3 hours; discussion, 1 hour; Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to PHIL 005. An introduction to the nature of evil, its motivation, and its origins. Utilizes a variety of sources to examine these themes, including classical philosophical texts and contemporary films. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL 005 or PHIL 005H.

PHIL 006 Reason, Belief, and Truth 4 Lecture, 3 hours; discussion, 1 hour; Prerequisite(s): none. An introductory examination of the nature of reason, rationality, argument, proof, and persuasion and the nature of theory, belief, faith and conviction, and truth and falsity. Discusses the various bodies of belief and modes of inquiry, such as the natural and social sciences, the humanities, morality, religion, and mathematics.

PHIL 007 Introduction to Critical Thinking 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A practical examination of reasoning and argument topically illustrated. Credit is awarded for one of the following PHIL 007 or PHIL 007H.

PHIL 007H Honors Introduction to Critical Thinking 4 Lecture, 3 hours; discussion, 1 hour; Term Paper, 3 hours. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to PHIL 007. A practical examination of reasoning and argument, topically illustrated. Satisfactory (S) or No Credit (NC) grading is not available. Credit is only awarded for one of PHIL 007 or PHIL 007H.

PHIL 008 Introduction to Logic 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to symbolic logic. Teaches how to distinguish in a precise way valid deductive arguments from those that are invalid.

Includes learning to use logical symbolism, truth tables, and formal deductions. Credit is awarded for one of the following PHIL 008 or PHIL 008H.

PHIL 008H Honors Introduction to Logic 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to PHIL 008. An introduction to symbolic logic. Teaches how to distinguish, in a precise way, valid deductive arguments from those that are invalid; includes learning symbolism, truth tables, and formal deductions. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL 008 or PHIL 008H.

PHIL 009 Biomedical Ethics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces the major camps in ethical theory: utilitarianism, deontology, virtue ethics, and feminist ethics. Applies these theories to critically examine contemporary issues in bioethics. Includes stem-cell research, assisted reproductive technologies, contract gestation, maternal-fetal conflicts, genetic and pharmacological enhancements, access to health care, and physician-assisted suicide. Credit is awarded for one of the following PHIL 009 or PHIL 009H.

PHIL 009H Honors Biomedical Ethics 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to PHIL 009. Introduces the major camps in ethical theory - utilitarianism, deontology, virtue ethics, and feminist ethics. Applies these theories to critically examine contemporary issues in bioethics. Includes stem-cell research, assisted reproductive technologies, contract gestation, maternal-fetal conflicts, genetic and pharmacological enhancements, access to health care, and physician-assisted suicide. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL 009 or PHIL 009H.

PHIL 010 Language, Mind, and Reality 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): none. Explores the nature of language, communication, and mentality and their role in shaping our thought and experience of the world. Tackles questions about the innateness of concepts, the social and rational norms governing communication, the nature of speech acts and their connection to hate speech and pornography, and the scope of mentality. Credit is awarded for only one of PHIL 010 or PHIL 010H.

PHIL 010H Honors Language, Mind, and Reality 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to PHIL 010. Explores the nature of language, communication, and mentality and their role in shaping our thought and experience of the world. Tackles questions about the innateness of concepts, the social and rational norms governing communication, the nature of speech acts and their connection to hate speech and pornography, and the scope of mentality. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of PHIL 010 or PHIL 010H.

PHIL 012 Introductory Seminar in Moral Philosophy 4 Seminar, 3 hours; extra reading, 32 hours. Prerequisite(s): none. An introduction to a small number of central moral issues: Small class size in order to provide for substantial discussion and close supervision of written papers.

PHIL 030 (E-Z) Introduction to the History of Philosophy 4 Lecture, 3 hours; discussion, 1 hour. Introductory surveys of important periods and subjects in the history of Western philosophy. Topics include E. Hellenic Philosophy: Pre-socratics Through Aristotle; F. Hellenistic Philosophy: Epicureans, Stoics, And Skeptics; G. Medieval Philosophy; I. Early Modern Philosophy; J. Late Modern Philosophy; K. Nineteenth-century Philosophy; M. History Of Ethics; N. History Of Political Philosophy.

Upper-Division Courses

PHIL 100 Sophomore-Junior Seminar 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): one course in philosophy; sophomore, junior, or senior standing in Philosophy or Philosophy/Law and Society. A writing-intensive seminar designed to introduce students to philosophical analysis and writing through an in-depth focus on a philosophical text or issue. Content varies. Credit is awarded for only one of PHIL 100 or PHIL 101.

PHIL 101 Sophomore and Junior Lecture 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): one course in philosophy; sophomore, junior, or senior standing in Philosophy or Philosophy/Law and Society. A writing-intensive seminar designed to introduce students to philosophical analysis and writing through an in-depth focus on a philosophical text or issue. Content varies. Credit is awarded for only one of PHIL 100 or PHIL 101.

PHIL 107 Languages and Minds 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): one course in philosophy or consent of instructor. An investigation of interrelated issues in the philosophy of mind and language, including the mind-body relation, theories of meaning, how thoughts and language represent states of affairs in the world, and the nature of consciousness.

PHIL 108 Philosophical Issues of Race and Gender 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Investigates philosophical issues concerning race and gender. Includes the role of cultural and biological criteria in defining these concepts; roles of race and gender in personal identity; nature of racism, sexism, and their variants; and policy implications such as affirmative action and the civil status of homosexual relationships. Cross-listed with GSST 108.

PHIL 109 Philosophy of Technology 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. An introduction to philosophical issues concerning technology. Includes the nature of technology; technical artifacts and design; technological knowledge; techno-science; the development of technology; ethical problems concerning technology; technology and gender; socio-technological systems and technocracy; anti-technology; technology and art; and technology and the environment.

PHIL 110 Asian Philosophy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. A survey of Asian contributions to philosophy focusing on the Indian and Chinese traditions. Examines questions concerning how best to live one's life, what can be known, the relation between mind and body, whether there are minds and bodies, and the nature of the universe. Cross-listed with CHN 112.

PHIL 111 Philosophy, Film, and Reflective Popular Culture 4 Lecture, 3 hours; screening, 1 hour; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines a number of philosophical themes as depicted in film and other media of reflective popular culture. Includes screenings of four or five films; each is examined for the philosophical issues it raises. Themes may include integrity, love, spirituality, meaning, identity, and morality.

PHIL 112 Mortal Questions 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Focuses on aspects of the distinctively human capacity to lead a meaningful life by investigating aspects of the nature of the mind and human freedom. Discusses the nature of death and its place in the context of a meaningful life.

PHIL 113 God 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. Topics include examination of the nature of divinity and the nature of evil, the influence of the concept of God upon philosophical history, ideals, and values, and the riddle of an after-life.

PHIL 114 Science and Human Understanding 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. Discusses how contemporary philosophers have examined human understanding as exemplified in science.

PHIL 115 The Care of the Soul 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A historical and contemporary examination of the role philosophy has played in nurturing the human spirit in the face of other philosophical efforts to demythologize the soul into neural functions or even mere congeries of atoms in motion in the void.

PHIL 116 Business Ethics 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An inquiry into some of the moral issues arising from business life, such as conflicts of interest,

responsibility to consumers, corporate culture and character, and the morality of competition. Also considers the history of ethics and the history business as an institution.

PHIL 117 Environmental Ethics 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N; or consent of instructor. A philosophic consideration of ethical problems that arise from the use and exploitation of the environment. Topics include workplace pollution hazards; environmental pollution and protection of collective natural resources; the rights of future generations; the rights of animals; the protection of endangered species; and related issues.

PHIL 118 Personhood and Personal Identity 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Develops basic elements of the concept of personhood and how persons are thought to differ crucially from non-human animals. Considers theories about what is essential to individuals and what makes one the same person over time. Explores the relationship between these metaphysical issues and various moral issues.

PHIL 119 Economics and Philosophy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 104B or consent of instructor. Examines issues on the boundary of economics and philosophy. Topics include social choice theory and economic justice; foundations of utility theory, rational choice, and economic welfare; and epistemology and the philosophies of science of Popper, Kuhn, and others. Cross-listed with ECON 117.

PHIL 120 (E-Z) Ancient Philosophy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N. Each segment covers a major figure in ancient Greek or Roman philosophy. E. Plato; F. Aristotle; G. Plato And Aristotle; I. Cicero; J. Seneca; K. Plutarch.

PHIL 121 (E-Z) Major Philosophers 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N. Each segment covers a major figure in the history of medieval, early modern, or late modern philosophy. E. Aquinas; F. Descartes; G. Leibniz; I. Spinoza; J. Locke; K. Hume; M. Reid; N. Kant; O. Hegel; Q. Nietzsche; R. Royce; S. Freud; T. Heidegger; V. Wittgenstein; X. Kripke.

PHIL 122 (E-Z) Topics in Hostory of Philosophy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N. Topics include E. Ancient Philosophy; F. Medieval Philosophy; I. French Renaissance Philosophy; J. Early Modern Philosophy; M. Moral Theories Of Hume And Kant; N. Nineteenth-century Philosophy; O. Kant And Post-kantian European Moral Philosophy; Q. Political Philosophy; R. Origins Of Analytical Philosophy.

PHIL 123 Readings in Classical Chinese Philosophy 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): CHN 104 or consent of instructor. Introduces selections from key philosophical texts in classical Chinese. Focuses on a combination of Chinese reading and philosophical understanding. Cross-listed with CHN 106.

PHIL 124 Formal Logic 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 011/ MATH 011 or CS 120A/EE 120A or CS 150 or PHIL 008 or PHIL 008H or consent of instructor. An introduction to first-order logic, the core of the logic often used in contemporary philosophy, mathematics, computer science, and linguistics.

PHIL 125 Intermediate Logic 4 Lecture, 3, hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): PHIL 124 or consent of instructor. The basic metatheory of first-order logic; with an emphasis on the precise relation between its syntax (formulas, rules of inference, and proofs) and semantics (interpretations, truth, validity), leading to the soundness and completeness theorems.

PHIL 126 Advanced Logic 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): PHIL 124 with a grade of C- or better; or consent of instructor. Advanced metatheory of first-order logic, leading to a discussion of some of the important incompleteness, undecidability, and non-expressability results of twentieth-century logic. Includes the writings of Godel, Church, and Turing.

PHIL 127 Advanced Topics in Logic 4 Lecture, 3 hours; extra reading, 1 hour; activity, 3 hours. Prerequisite(s): PHIL 124 with a grade of C- or better; or consent of instructor. A study of selected non-truth-functional and nonstandard logics. Includes modal logics, tense logics, free logics, paraconsistent logics, and set theory. Course is repeatable.

PHIL 128 Introduction to Arabic Philosophy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to Arabic philosophical texts. Provides close and literary reading of texts in philosophy, as well as considers the impact these texts have had or can have on Western cultural formation. Cross-listed with ARLC 154, and CPLT 154.

PHIL 129 History of Philosophy in India 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An examination of the main philosophical themes, figures, and texts in premodern India. Pays particular attention to Hindu, Buddhist, and Jain philosophy. Cross-listed with AST 130, and RLST 129.

PHIL 130 Theory of Knowledge 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N; or consent of instructor. An inquiry into the nature of human knowledge: its possibility, criteria, scope, and limitations.

PHIL 131 Twentieth-Century Analytic Philosophy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N. A discussion of some major issues and thinkers in the tradition dominant in twentieth-century British and American philosophy. Philosophers discussed might include Frege, Russell, Carnap, Quine, Kripke, and D. Lewis.

PHIL 132 Philosophy of Language 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A study of some of the traditional issues in the philosophy of language, such as analyticity, theories of reference, truth, speech act theory, and philosophical theories of formal grammars.

PHIL 133 Metaphysics 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N; or consent of instructor. An investigation of some of the traditional problems in Western philosophy that have been labeled metaphysical, such as the existence of God, the relationship between mind and body, the determinism versus free

will debate, and the nature of time and space.

PHIL 134 Philosophy of Mind 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N; or consent of instructor. A study of several theories of the nature of mind and an analysis of particular issues occasioned by them: the mind-body problem, personal identity, emotions, human action, self-knowledge, knowledge of other minds, and explanations of human behavior.

PHIL 135 Philosophy of Psychology 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N; or consent of instructor. Examines philosophical issues arising in the context of empirical psychology. Topics may include moral development, artificial intelligence and the modeling of cognition, the nature of perception and memory, fallacies in human reasoning, mechanisms of self-understanding, and mental illness and personhood.

PHIL 137 Philosophy of Science 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N; or consent of instructor. Topics discussed include understanding scientific objectivity in the light of history and sociology of science; realism and anti-realism about scientific theories; scientific methodology and its logic; and the nature of scientific explanation.

PHIL 138 Philosophy of Agency 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N; or consent of instructor. An investigation of problems that arise in attempts to understand human agency: the nature and explanation of action, intention, free will and moral responsibility, and weakness of will.

PHIL 139 Philosophy of Mathematics 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): PHIL 124; or one mathematics course; or consent of instructor. Discusses topics including abstract nature of mathematical objects, the sources of mathematical knowledge, the relation between mathematics and logic, and the infinite in mathematics. Considers the development of some selected parts of mathematics (especially arithmetic, geometry, algebra, and set theory) and of various corresponding philosophical positions (platonism, formalism, intuitionism, structuralism). Course is repeatable.

PHIL 140 Topics in Metaphysics 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. An in-depth discussion of selected issues in contemporary metaphysics, such as abstract objects, essentialism and identity, laws of nature, free will, and determinism. Course is repeatable as content changes.

PHIL 142 Advanced Topics in the Philosophy of Language 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): PHIL 107 or PHIL 132 or consent of instructor. An in-depth study of a particular topic in the philosophy of language. Potential topics include context-sensitivity (how the meaning of a sentence depends upon nonlinguistic facts about context); theories of meaning (e.g., the Frege-Russell account in terms of propositions, the Lewis-Stalnaker possible worlds account, and Davidson's truth theory account). Courses is repeatable as content changes to a maximum of 8 units. Credit is awarded for only one of PHIL 142 or PHIL 242.

PHIL 144 Advanced Topics in Philosophy of Mind 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): PHIL 107 or PHIL 134 or consent of instructor. Examines a selected topic in philosophy of mind. Potential topics include consciousness and self-consciousness; intentionality and theories of mental content; mental causation; consciousness and free will; introspection and knowledge of other minds; perception; emotion; imagination; concepts and rationality; artificial minds; and animal minds. Course is repeatable as content changes to a maximum of 8 units. Credit is awarded for only one of PHIL 144 or PHIL 244.

PHIL 150 Philosophy in Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one course in philosophy or consent of instructor. An examination of philosophical issues raised by selected novelists, poets, and playwrights.

PHIL 151 Existentialism 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An examination of philosophical and literary works which deal with the significance of some fundamental human experiences: identity crises, choice and commitment, anxiety and death, the experience of meaninglessness, and alienation.

PHIL 152 Twentieth-Century Continental Philosophy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N; or consent of instructor. Examines the character and consequences of several recent movements in continental philosophy, including hermeneutics, structuralism, deconstruction, and critical theory. Discusses authors including Heidegger, Gadamer, Habermas, Derrida, and Foucault.

PHIL 153 Marxist Critique 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the ideas central to the tradition of Western Marxism: ideology, critique, reification, instrumental reason, the domination of nature, and communicative action. Theorists discussed typically include Hegel, Marx, Lukacs, Adorno, Horkheimer, Benjamin, and Habermas. Credit is awarded for only one of PHIL 153 or PHIL 253.

PHIL 154 Phenomenology 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. A study of the structures and conditions of the lived experience of the world. Explores the major issues, methodology, and historical development of the phenomenological tradition in philosophy. Discusses philosophers including Edmund Husserl, Edith Stein, Martin Heidegger, Max Scheler, Jean-Paul Sartre, Simone de Beauvoir, and Maurice Merleau-Ponty.

PHIL 155 Peace in the Middle East 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the roots of the Middle Eastern crises. Focuses on the Arab-Israeli conflict and possible solutions toward peace. Addresses problems through historical, religious, and political lines of inquiry. Cross-listed with RLST 155.

PHIL 159 Philosophy of Religion 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A historical, critical examination of the concepts and arguments involved in the Judeo-Christian God-hypothesis, and the influence of this world view upon the ideals and values of the Western world.

PHIL 161 Ethics 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N; or consent of instructor. A study of the major classical moral philosophers in the Western tradition and of some selected problems of metaethics.

PHIL 162 Human Nature and Radical Evil 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N; or consent of instructor. An advanced study of theories of human nature and evil.

PHIL 163 Political Philosophy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An inquiry into some of the main philosophic issues arising from political life, such as the nature and justification of authority, democracy, natural rights, justice, equality, and civil disobedience.

PHIL 164 Justice 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A philosophical analysis of the concept of justice.

PHIL 165 Philosophy of Law 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An inquiry into the nature of criminal law, the relation between law and morality, the nature of legal responsibility, and the obligation to obey the law. Credit is awarded for one of the following PHIL 165 or PHIL 165H.

PHIL 165H Honors Philosophy of Law 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; admission to University Honors; or consent of instructor. Honors course corresponding to PHIL 165. An inquiry into the nature of criminal law, the relation between law and morality, the nature of legal responsibility, and the obligation to obey the law. Credit is awarded for one of the following PHIL 165H or PHIL 165.

PHIL 166 Philosophy of Feminism 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An analysis of current concepts and debates in feminist philosophy including gender equality, gender difference, and the relation of sex and gender. Situates various approaches to these topics in the history of philosophy.

PHIL 167 Biomedical Ethics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A philosophical discussion of newly emerging issues, both ethical and social, in biology and medicine, such as genetic engineering, euthanasia, experimentation with human subjects, abortion, behavior control, and patient's right to know.

PHIL 168 Ethics and Families 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Analyzes ethical issues with regard to families. Explores gender relations in traditional marriages; the ethics of same-sex marriage; the morality of abortion, surrogate mothering, and cloning; the justice of school vouchers; the grounds for universal health care; and possible gender inequalities in divorce.

PHIL 169 (E-Z) Topics in Value Theory 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 001 or PHIL 001H or PHIL 002 or PHIL 002H or PHIL 003 or PHIL 003H or PHIL 003W or PHIL 003X or PHIL 004 or PHIL 005 or PHIL 006 or PHIL 007 or PHIL 007H or PHIL 008 or PHIL 008H or PHIL 009 or PHIL 009H or PHIL 010 or PHIL 010H or PHIL 012 or PHIL 030E or PHIL 030F or PHIL 030G or PHIL 030I or PHIL 030J or PHIL 030K or PHIL 030M or PHIL 030N; restricted to class level standing of junior, or senior. Topics include E. Ethics; F. Aesthetics; G. Political Philosophy; I. Social Philosophy; J. Philosophy Of Law.

PHIL 171 Feminist Bioethics 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An exploration of the ways in which feminist theory provides insight on contemporary issues in bioethics. Topics include women in clinical research, cosmetic surgery, abortion, contract gestation, fetal protection policies, and the politics of mental illness.

PHIL 172 Reading Philosophical German 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): GER 002R or GER 004 or consent of instructor. Develops reading strategies and translation skills for German philosophical texts through a review of grammar and readings in the original language. Prepares for a graduate-level translation exam and independent research in German. Intermediate to advanced German reading proficiency required; familiarity with German philosophical works is recommended but not required. Cross-listed with GER 172.

PHIL 173 Philosophy of Sex and Sexuality 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Investigates philosophical issues relating to human sexual behaviors and identities. Topics include attempts to distinguish sexual from nonsexual activities; the construction and medicalization of sex and sexuality; and historical and contemporary ethical evaluations of various sexual activities and identities (homosexuality, heterosexuality, masturbation, sadomasochism, various fetishisms, polyamory, and other nonmonogamies).

PHIL 174 Philosophy of Art and Aesthetics 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): Restricted to class level standing of junior, or senior; or consent of instructor. Examination of the main topics in the philosophy of art and aesthetics through both historical and contemporary sources. Addresses the following questions: What is art? What is beauty? What is the relation between the beautiful, the true, and the good? Is beauty mind-dependent? Are there objective standards for judging artworks?

PHIL 190 Special Studies 1 to 5 Prerequisite(s): to be taken with the consent of the department chair as a means of meeting special curricular problems. Course is repeatable to a maximum of 16 units.

PHIL 193 Senior Seminar 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): two upper-division courses in philosophy; senior standing in Philosophy or Philosophy/Law and Society or consent of instructor. Advanced seminar for Philosophy majors. Course is repeatable as content changes to a maximum of 8 units.

PHIL 195 Senior Thesis 1 to 4 Prerequisite(s): enrollment by request of student with approval of department chair . Course is graded In Progress (IP) until the thesis is completed. Course is repeatable to a maximum of 8 units.

PHIL 198 R'course: Variable Topics 1 Activity hours vary per R'Course proposal. Prerequisite(s): permission needed from department; sophomore standing or better. An opportunity for UCR undergraduate students to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original course topics are variable and unique from other departmental course offerings, designed to highlight the student facilitators' expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as topics change to a maximum of 8 units.

PHIL 198I Individual Internship in Philosophy 2 to 8 Internship, 4 to 16 units; written work, 2 to 8 hours. Prerequisite(s): upper-division standing; consent of instructor. An intern assignment in government, education, science, business, or other field related to philosophy. Students write a substantive philosophical paper pertaining to the work done in the internship. Course is repeatable to a maximum of 8 units.

Graduate Courses

PHIL 220 (E-Z) Ancient Philosophy 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. Each segment covers a major figure in ancient Greek or Roman philosophy. E. Plato; F. Aristotle; G. Plato And Aristotle; I. Cicero; J. Seneca; K. Plutarch.

PHIL 221 (E-Z) Major Philosophers 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. Each segment covers a major figure in the history of medieval, early modern, or late modern philosophy. E. Aquinas; F. Descartes; G. Leibniz; I. Spinoza; J. Locke; K. Hume; M. Reid; N. Kant; O. Hegel; Q. Nietzsche; R. Royce; S. Freud; T. Heidegger; V. Wittgenstein; X. Kripke.

PHIL 222 (E-Z) Topics in History of Philosophy 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. Topics include E. Ancient Philosophy; F. Medieval Philosophy; I. French Renaissance Philosophy; J. Early Modern Philosophy; M. Moral Theories Of Hume And Kant; N. Nineteenth-century Philosophy; O. Kant And Post-kantian European

Moral Philosophy; Q. Political Philosophy; R. Origins Of Analytical Philosophy.

PHIL 242 Advanced Topics in the Philosophy of Language 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. An in-depth study of a particular topic in the philosophy of language. Potential topics include context-sensitivity (how the meaning of a sentence depends upon nonlinguistic facts about context); theories of meaning (e.g., the Frege-Russell account in terms of propositions, the Lewis-Stalnaker possible worlds account, and Davidson's truth theory account). Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 8 units. Credit is awarded for only one of PHIL 142 or PHIL 242.

PHIL 244 Advanced Topics in Philosophy of Mind 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. Examines a selected topic in philosophy of mind. Potential topics include consciousness and self-consciousness; intentionality and theories of mental content; mental causation; consciousness and free will; introspection and knowledge of other minds; perception; emotion; imagination; concepts and rationality; artificial minds; and animal minds. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 8 units. Credit is awarded for only one of PHIL 144 or PHIL 244.

PHIL 253 Marxist Critique 4 Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): graduate standing. An examination of the ideas central to the tradition of Western Marxism: ideology, critique, reification, instrumental reason, the domination of nature, and communicative action. Theorists discussed typically include Hegel, Marx, Lukacs, Adorno, Horkheimer, Benjamin, and Habermas. Students who complete all writing assignments, including a term paper, receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Credit is awarded for only one of PHIL 153 or PHIL 253.

PHIL 270 Philosophy Colloquia 1 Colloquium, 1 hour. Prerequisite(s): graduate standing. Visiting scholars give oral reports on current research in philosophy and discuss them with students and faculty. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PHIL 272A Workshop in Philosophy 2 to 4 Workshop 2 To 3, Research 1 To 3, Prerequisite(s): graduate standing; consent of instructor. Close reading of a philosophical text or texts on a single topic. May be undertaken as a one-, two-, or three-quarter course (PHIL 272A, PHIL 272B, PHIL 272C). Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. PHIL 272A, PHIL 272B, and PHIL 272C are repeatable to a maximum of 12 units on one topic and to a maximum of 36 units for the three courses.

PHIL 272B Workshop in Philosophy 2 to 4 Workshop 2 To 3, Research 1 To 3, Prerequisite(s): PHIL 272A; consent of instructor. Close reading of a philosophical text or texts on a single topic. May be undertaken as a one-, two-, or three-quarter course (PHIL 272A, PHIL 272B, PHIL 272C). Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. PHIL 272A, PHIL 272B, and PHIL 272C are repeatable to a maximum of 12 units on one topic and to a maximum of 36 units for the three courses.

PHIL 272C Workshop in Philosophy 2 to 4 Workshop 2 to 3, Research 1 to 3, Prerequisite(s): PHIL 272B; consent of instructor. Close reading of a philosophical text or texts on a single topic. May be undertaken as a one-, two-, or three-quarter course (PHIL 272A, PHIL 272B, PHIL 272C). Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. PHIL 272A, PHIL 272B, and PHIL 272C are repeatable to a maximum of 12 units on one topic and to a maximum of 36 units for the three courses.

PHIL 275A Proseminar For First-Year Graduate Students: Metaphysics and Epistemology 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): first-year standing in the graduate program in Philosophy. One course in a three-term sequence designed to introduce new graduate students to current issues and methods of research in metaphysics and epistemology.

PHIL 275B Proseminar For First-Year Graduate Students: Metaphysics and Epistemology 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): PHIL 275A; first-year standing in the graduate program in Philosophy. One course in a three-term sequence designed to introduce new graduate students to current issues and methods of research in additional areas of metaphysics and epistemology.

PHIL 275C Proseminar For First-Year Graduate Students: Moral Philosophy 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): first- year standing in the graduate program in Philosophy. One course in a three-term sequence designed to introduce new graduate students to current issues and methods of research.

PHIL 276 Third and Fourth Year Research Seminar 2 or 4 Seminar, 2 hours; extra reading, 3 hours; research, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Teaches skills needed for professional quality research. Familiarizes students with expectations and demands of producing professional work. Provides a forum for acquiring and applying skills to meet expectations and demands. Offers opportunity to present research in progress. Provides a structured environment to develop and hone relevant time management strategies. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 12 units.

PHIL 280 Seminar in Philosophical Problems 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Considers an important philosophical problem. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

PHIL 281 Philosophical Texts 4 Seminar, 3 hours; research, 9 hours. Prerequisite(s): graduate standing; or consent of instructor. Involves focused reading and discussion of common text on research topics in philosophy. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) No Credit (NC) grade. Course is repeatable.

PHIL 282 Seminar in Individual Philosophers 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Considers a major figure in the history of philosophy. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

PHIL 283 Seminar in Contemporary Philosophy 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Covers an aspect of contemporary philosophy. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

PHIL 284A Problems in the History of Philosophy 4 Seminar, 3 hours; research, 9 hours. Prerequisite(s): graduate standing or consent of instructor. Focused reading of texts or problems in the history of Philosophy. May be taken as a one quarter course or with PHIL 284B as part of a two quarter sequence. Students taking PHIL 284A as a one quarter course who submit a term paper receive a letter grade; other students taking it as a one quarter course receive a Satisfactory (S) or No Credit (NC) grade. Students taking PHIL 284A as part of a two quarter sequence with PHIL 284B receive In Progress (IP) until PHIL 284B is completed, at which time one final grade is assigned for both courses. Course is repeatable to a maximum of 40 units.

PHIL 284B Problems in the History of Philosophy 4 Seminar, 3 hours; research, 9 hours. Prerequisite(s): graduate standing or consent of instructor. Focused reading of texts or problems in the history of Philosophy. May be taken as a one quarter course or with PHIL 284A as part of a two quarter sequence. Students taking PHIL 284B as a one quarter course who submit a term paper receive a letter grade; other students taking PHIL 284B as a one quarter course receive a Satisfactory (S) or No Credit (NC) grade. Students taking PHIL 284B as part of a two quarter sequence with PHIL 284A who submit a term paper receive one grade for both courses; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 40 units.

PHIL 285A Problems in Contemporary Philosophy 4 Seminar, 3 hours; research, 9 hours. Prerequisite(s): graduate standing or consent of instructor. Covers a problem or a literature in an area of contemporary philosophy. May be taken as a one quarter course or with PHIL 285B as part of a two quarter sequence. Students taking PHIL 285A as a one quarter course who submit a term paper receive a letter grade; other students taking PHIL 285A as a one quarter course receive a Satisfactory (S) or No Credit (NC) grade. Students taking PHIL 285A as part of a two quarter sequence with PHIL 285B receive In Progress (IP) until PHIL 285B is completed, at which time one final grade is assigned for both courses. Course is repeatable to a maximum of 40 units.

PHIL 285B Problems in Contemporary Philosophy 4 Seminar, 3 hours; research, 9 hours. Prerequisite(s): graduate standing or consent of instructor. Covers a problem or a literature in an area of contemporary philosophy. May be taken as a one quarter course or with PHIL 285B as part of a two quarter sequence. Students taking PHIL 285-A as a one quarter course who submit a term paper receive a letter grade; other students taking PHIL 285-A as a one quarter course receive a Satisfactory (S) or No Credit (NC) grade. Students taking PHIL 285-A as part of a two quarter sequence with PHIL 285-B receive In Progress (IP) until PHIL 285-B is completed, at which time one final grade is assigned for both courses. Course is repeatable to a maximum of 40 units.

PHIL 290 Directed Studies 1 to 6 Term paper, 3 to 18 hours. Prerequisite(s): graduate standing; or consent of instructor. Directed study to meet special curricular needs. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) No Credit (NC) grade. Course is repeatable.

PHIL 291 Individual Studies in Coordinated Areas 2 to 4 Prerequisite(s): graduate standing. A program of studies designed to advise and assist candidates who are preparing for the Comprehensive Examinations. Open to M.A. students only; does not count toward the unit requirement for the M.A. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PHIL 292 Concurrent Analytical Studies in Philosophy 1 to 4 Prerequisite(s): consent of instructor. Each 292 course will be taken concurrently with some 100-series course, approved by the Graduate Advisor, but on an individual basis. It will be devoted to completion of a graduate paper based on research or criticism related to the 100-series course. Faculty guides and evaluations will be provided throughout the quarter. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

PHIL 297 Directed Research 1 to 6 Prerequisite(s): graduate standing. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PHIL 299 Research For Thesis Or Dissertation 1 to 12 Prerequisite(s): graduate standing. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

PHIL 301 Directed Studies in the Teaching of Philosophy 1 Seminar, 1 hour. Prerequisite(s): graduate standing. A program of orientation, lectures, and workshops designed to enhance the Teaching Assistant's understanding of teaching methods in philosophy and to provide opportunities to work closely with experts in college teaching in order to improve the quality of instruction. Required of all new Teaching Assistants. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PHIL 302 Teaching Practicum 1 to 4 Prerequisite(s): employment as Teaching Assistant or Associate. Supervised teaching in lower-division courses and LWSO 100. Required of all teaching assistants in philosophy. Does not count toward the unit requirement for the M.A. degree. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

PHIL 400 Research and Professional Development Workshop 1 Workshop, 8 hours; extra reading, 8 hours. Prerequisite(s): graduate standing. A series of presentations and workshops focused on a variety of issues in research, professional development, and teaching. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 18 units.

Physical Sciences

College of Natural and Agricultural Sciences

The Physical Sciences major is not accepting new students at this time. For more information, contact the CNAS Undergraduate Academic Advising Center, 1223 Pierce Hall, or call (951) 827-7294.

Physics and Astronomy

Subject abbreviation: PHYS
College of Natural and Agricultural Sciences

Shan-Wen Tsai, Ph.D., Chair
Department Office, 3047 Physics
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Shan-Wen Tsai, Ph.D.
Hai-Bo Yu, Ph.D.
Roya Zandi, Ph.D.

Professors Emeriti

Robert B. Clare, Ph.D.
France Cordova, Ph.D.
Bipin R. Desai, Ph.D.
Sun-Yiu Fung, Ph.D.
Frederick Hamann, Ph.D.
Gail G. Hanson, Ph.D. *Distinguished Professor*
Nai-Li H. Liu, Ph.D.
Owen Long, Ph.D.
Ernest S. Ma, Ph.D.
Umar Mohideen, Ph.D. *Distinguished Professor*
John C. Nickel, Ph.D.
Douglas E. MacLaughlin, Ph.D.
Raymond L. Orbach, Ph.D.
Leonid P. Pryadko, Ph.D.
Richard K. Seto, Ph.D.
Eugen S. Simanek, Ph.D.
Chandra M. Varma, Ph.D. *Distinguished Professor*
Jose Wudka, Ph.D.
Jory A. Yarmoff, Ph.D. *Distinguished Professor*
Allen D. Zych, Ph.D.

Associate Professors

Michael G. Anderson, Ph.D.
Igor Barsukov, Ph.D.
Simeon Bird, Ph.D.
Yanou Cui, Ph.D.
Yongtao Cui, Ph.D.
Anson D'Aloisio, Ph.D.
Boerge Hemmerling, Ph.D.
Thomas Kuhlman, Ph.D.
Joshua Lui, Ph.D.
Michael Mulligan, Ph.D.
Flip Tanedo, Ph.D.
Peng Wei, Ph.D.

Assistant Professors

Steve Choi, Ph.D.
Benjamin Donovan, Ph.D.
Andrew Joe, Ph.D.
Miguel Arratia Munoz, Ph.D.
Jon Richardson, Ph.D.
Shawn Westerdale, Ph.D.

**

Major

The Department of Physics and Astronomy offers two undergraduate degrees: the B.A. and B.S. in Physics.

The **B.S. program** is designed for students with a strong interest in the sciences or engineering who wish to emphasize this aspect of their education and training. The B.S. degree provides a strong background for students who wish to continue on to graduate school.

The **B.A. program** follows the liberal arts tradition with a broader coverage of the humanities and social sciences. It is selected often by students who intend to obtain a teaching credential with a specialty in science or to pursue a career combining business management

opportunities with a knowledge in science and technology.

The extensive course offerings and modern facilities within the Department of Physics and Astronomy, coupled with close, personal counseling by faculty advisors, provide students with a physics program that is characterized by its breadth and flexibility.

Career Opportunities

Graduates with a bachelor's degree in Physics generally begin their careers in government or industry. Professions include research and development, system modeling and analysis, and sales in a large variety of fields. A Physics degree provides one of the most flexible qualifications with direct applications to materials science, advanced electronics, lasers and microwave devices, computing and communications.

The federal government and national laboratories employ many physicists as do industries in medical and scientific instruments, computers, audio and telecommunications equipment, financial analysis and investments, material science, and engineering.

The bachelor's degree programs in the UCR Department of Physics and Astronomy are well suited for continued education in graduate school and for preparation in technical and professional careers. Colleges or universities, national laboratories, industry, and governmental agencies employ students with graduate training.

Transfer Students

Students transferring to the Physics major must complete courses comparable to the following one-year sequences before they transfer:

1. General physics (calculus-based) equivalent to PHYS 040A, PHYS 040B, PHYS 040C
2. First-year calculus, equivalent to MATH 007A or MATH 009A, MATH 007B or MATH 009B, MATH 009C

Students must have a minimum grade point average of 2.70 in transferable college courses. UCR has articulation agreements with most of the California community colleges. These agreements list specific community college courses that have been designated as comparable to UCR courses (see the statewide articulation Web site at www.assist.org). Transfer students will usually find it advantageous to complete most or all sequences before starting at UCR. All prospective transfers should try to complete the sequences they begin rather than divide a sequence between two campuses.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

Major Requirements

The major requirements consist of a core curriculum and additional requirements for various B.S. degrees. The core requirements for the B.A. and B.S. degrees in Physics are as follows:

1. **Lower-division requirements (70 units)**
   a) one of the following sequences: PHYS 041A, PHYS 041B, PHYS 041C, or PHYS 040A or PHYS 40HA, PHYS 040B or PHYS 40HB, PHYS 040C or PHYS 40HC, PHYS 040D, PHYS 040E. The first sequence is preferred for the B.S. in Physics.
   b) PHYS 039
   c) MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C. Students may also satisfy the first-year calculus requirement with the following alternative series: MATH 005A, MATH 005B, MATH 005C
   d) MATH 010A, MATH 010B, MATH 046
   e) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
   f) Either CS 009A, taught using the Python language (recommended), or CS 010A, taught using the C++ language. A high-level CS course may satisfy this CS requirement with approval.
2. **Upper-division requirements (41 to 42 units)**
   a) PHYS 130A, PHYS 130B, PHYS 132, PHYS 135A, PHYS 135B, PHYS 156A, PHYS 156B
   b) PHYS 139L (5 units), PHYS 142L (4 units) or PHYS 142W (5 units). Note that PHYS142W satisfies the ENGL 001C requirement.
   c) 4 units of upper-division Physics electives. Upper-division math, science or engineering may be substituted with approval.

Physics: Standard Track (B.S. degree)

1. **Additional upper-division requirements (16 to 17 units)**
   a) PHYS 136
   b) One of the following: one additional quarter of PHYS 142L (4 units) or PHYS 142W (5 units); at least 4 units of Senior Thesis (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D); at least 4 units of Internship in Physics (PHYS 198I); participation in an approved summer research program, such as a NSF REU, and an additional 4 units of upper-division physics elective.
   c) 8 additional units of upper-division Physics electives. PHYS 156C is highly recommended for those planning to go to graduate school in physics.

Physics: Biophysics Track (B.S. degree)

1. **Additional lower-division requirements (25 units)**
   a) BIOL 005A, BIOL 005B, BIOL 005C, BIOL 05LA or BIOL 020.
   b) CHEM 008A, or CHEM 08HA, CHEM 008B or CHEM 08HB, CHEM 008C or CHEM 08HC, CHEM 08LA or CHEM 08HLA, CHEM 08LB or CHEM 08HLB, CHEM 08LC or CHEM 08HLC
2. **Additional upper-division requirements (8 units)**
   a) 8 additional upper-division units taken from BCH 110A, BCH 110B, BCH 110C or BIOL 107A (other upper-division CHEM/BIOL/BCH may be substituted upon approval)

Physics Education Track (B.S. degree)

1. **Additional lower-division requirements (6 units)**
   a) EDUC 003, EDUC 004
2. **Additional upper-division requirements (8 units)**
   a) Choose two courses from the following list: EDUC 105 (highly recommended), EDUC 147, EDUC 162, EDUC 132, EDUC 177, EDUC 179A

Physics: Applied Physics and Engineering Track (B.S degree)

1. **16 additional units of approved Engineering electives including a minimum of 8 units at the upper-division level.** A list of approved CS, EE, ME, CEE, CHE, and BIEN courses is available upon request from your physics faculty academic advisor or your advisor in the CNAS Advising Center. Example course plans can be found in the department web pages.

Physics: Astrophysics Track (B.S degree)

1. **Additional upper-division requirements (20 units)**
   a) PHYS 136, PHYS 111, PHYS 112, PHYS 166, PHYS 140L (PHYS 111, PHYS 112, or PHYS 166) can also satisfy the 4 units of upper-division core requirements in 2c. above.

Students continuing on to graduate school are encouraged to take additional upper-division courses in Mathematics, such as MATH 146A, MATH 146B, MATH 146C, MATH 165A, MATH 165B, and MATH 131.

Students may wish to earn a Minor in Mathematics which requires an additional 24 units of upper-division math.

To graduate, a minimum grade point average of 2.00 (C) is necessary overall and in the upper-division courses taken for the major (including upper-division courses listed under each track).

Bachelor of Arts

For the B.A. degree, additional units are required in Humanities, Social Sciences, and foreign language to meet the breadth requirements.

Minor

The minor in Physics consists of 26 upper-division units in Physics. A minimum of 16 units must be unique to the minor and may not be used to satisfy major requirements.

1. **First Tier (16 units)**
   a) PHYS 130A
   b) PHYS 132

c) PHYS 135A

d) One Upper Division Physics elective from PHYS 111, PHYS 150A, PHYS 151, PHYS 164, PHYS 165, PHYS 166, PHYS 177

2. **Second Tier: at least 10 units from any upper-division Physics courses not chosen in the First Tier.** The combined units from the First and Second Tiers should add to at least 26.
3. **No more than 4 units of 190-199 courses may be used to fulfill the upper-division units for the minor.**

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Community College Transfers

The department provides special advisory services to aid community college transfer students in formulating their program and in remedying any deficiencies in required course work. Transfer students who have followed the prescribed program at the community college should be able to continue with the sample program at the junior level.

Graduate Program in Physics

The Department of Physics and Astronomy offers the M.S. and Ph.D. degrees in Physics.

Ongoing research in the Department of Physics and Astronomy includes astrophysics and space physics, condensed matter physics, particle physics, heavy ion physics, surface science, laser physics, and environmental physics. Large-scale experiments are carried out at the major U.S. and European accelerator laboratories or observatories.

Admission: Physics-GRE scores are not required and all applications will be considered. Submission of the Physics-GRE scores, if available, it is encouraged. If you choose to submit your Physics-GRE scores, they will only be used when it raises the overall ranking of the application. Questions about requirements for admission should be directed to the graduate advisor at (951) 827-5332.

Master's Degree

A student is recommended for the degree of M.A. or M.S. in Physics upon completion of the following requirements:

1. Satisfactory completion of a minimum of 36 quarter units of approved physics courses taken for a letter grade after admission to graduate study. Of these, at least 24 quarter units must be in the 200 series. Each course must be passed with a grade of "B-" or better. Each student must maintain an average for all courses of "B" or better.
2. Either of the following two plans:

Plan I (Thesis)
Satisfactory completion of a thesis in a field of physics to be chosen in consultation with a faculty supervisor. This thesis is approved by a committee designated by the department.

Plan II (Comprehensive Examination)
Satisfactory performance on the comprehensive examination.

Under either plan all requirements for the master's degree must be completed not later than the end of the sixth quarter.

Normative Time to Degree Six quarters

Doctoral Degree

The Department of Physics and Astronomy offers the Ph.D. degree in Physics.

It is recommended that students in the Ph.D. program become associated with a research advisor by the end of Spring Quarter of their first year.

A student is recommended for advancement to candidacy for the Ph.D. degree in Physics upon completion of requirements (1), (2), and (3) below. The student is recommended for the Ph.D. degree upon completion of requirements (4) and (5) below.

1. **Course Work**
Each course must be passed with a grade of "B-" or better. Each student must maintain an average of "B" or better for all courses.

A. **Core courses for students pursuing a program in Physics (other than the Astrophysics Track):**

PHYS 205 (Classical Mechanics)

PHYS 210A, PHYS 210B, PHYS 210C (Electromagnetic Theory)

PHYS 212A, PHYS 212B (Thermodynamics and Statistical Mechanics)

PHYS 221A, PHYS 221B, PHYS 221C (Quantum Mechanics)

PHYS 296 (Summer Research in Physics and Astronomy)

PHYS 401 (Professional Development in Physics and Astronomy)

B. **Core courses for students pursuing a program in Physics on the Astrophysics Track:**

PHYS 205 (Classical Mechanics)

PHYS 210A, PHYS 210B, PHYS 210C (Electromagnetic Theory)

PHYS 212A (Thermodynamics and Statistical Mechanics, Part A)

PHYS 214 (Techniques of Observational Astrophysics)

PHYS 215 (Dynamics and Evolution of Galaxies)

PHYS 218 (Fundamentals of Astrophysics)

PHYS 219 (Cosmology and Structure Formation)

PHYS 296 (Summer Research in Physics and Astronomy)

PHYS 401 (Professional Development in Physics and Astronomy)

In addition, students in both programs must complete at least three additional elective graduate level lecture courses, taken for a letter grade. These courses must be physics or astronomy-related and relevant to the student's dissertation research. The program for each student must be approved by the Graduate Advisor and the student's Research Advisor. Such a program may entail more than the minimum number of courses and may also involve a mixture of courses from different areas.

The elective courses include the following, but other courses may be approved by the Graduate Advisor in consultation with the Graduate Advisory Committee:

a) **Condensed Matter, Surface, Biophysics and Atomic, Molecular and Optical Physics**

PHYS 209A (Quantum Electronics)

PHYS 209B (Nonlinear Optics)

PHYS 209C (Advanced Topics in Quantum Optics)

PHYS 234 (Physics of Nanoscale Systems)

PHYS 235 (Spintronics and Nanoscale Magnetism)

PHYS 240A, PHYS 240B (Condensed Matter Physics)

PHYS 241A, PHYS 241B, PHYS 241C (Advanced Statistical Physics and Field Theory)

PHYS 242 (Physics at Surfaces and Interfaces)

PHYS 245 (Atomic and Solid-State Physics with Positrons)

PHYS 246 (Biological Physics)

PHYS 260 (Special Topics in Condensed Matter Physics)

b) **Nuclear and Particle Physics**

PHYS 224 (Frontiers of Physics and Astrophysics)

PHYS 225A, PHYS 225B (Elementary Particles)

PHYS 230A, PHYS 230B, PHYS 230C (Advanced Quantum Mechanics and Quantum Theory of Fields)

PHYS 262 (Special topics in High Energy Physics)

c) **Astronomy, Astrophysics, Cosmology and Astroparticle Physics**

PHYS 203 (Statistical Astronomy)

PHYS 204 (Advanced Galaxy Formation and Cosmology)

PHYS 208 (General Relativity)

PHYS 211A (Radiative Processes in Astrophysics)

PHYS 211B (Astrophysical Fluid Dynamics)

PHYS 213 (Astrophysics of the Interstellar Medium)

PHYS 216 (Star Formation)

PHYS 217 (Stellar Structure and Evolution)

PHYS 226 (Cosmology)

PHYS 227 (Particle Astrophysics)

PHYS 229 (Theory of Dark Matter Halos and Galaxies)

PHYS 261 (Special topics in Astrophysics)

2. **Written Comprehensive Examinations**
Students must have satisfactory performance on a comprehensive examination, to be taken at the end of the student's

first year. In the event of a failure, a make-up exam is offered in the winter quarter of the second year. The comprehensive examination for students pursuing the physics program consists of an exam that covers Mechanics, Statistical and Thermal Physics, Quantum Mechanics, and Electromagnetism. The comprehensive examination for students pursuing the astronomy specialization consists of an exam that covers Mechanics, Statistical and Thermal Physics, Electromagnetism, and Fundamental Astrophysics.

3. **Oral Qualifying Examination in General Area of Proposed Research**
   Satisfactory performance on an oral examination in the general area of the student's proposed research. This examination is conducted by a doctoral committee, charged with general supervision of the student's research. It is normally taken during the academic year following that in which the comprehensive examination requirement has been successfully completed. A student who fails this examination on the first attempt may, at the discretion of the committee, be permitted to take it a second time.

   The Oral Qualifying Examination will be completed In-Person. Students taking the exam are expected to be present on campus with all committee members physically present. Hybrid or Remote exams are allowed by exception and approval from graduate advisor prior to the exam is required.
4. **Dissertation Examination**
   Students must complete a dissertation containing a review of existing knowledge relevant to the area of the candidate's research, and the results of the candidate's original research. This research must be of sufficiently high quality to constitute a contribution to knowledge in the subject area.
5. **Final Oral Examination**
   A final oral defense may be required. The final oral defense will be completed In-Person. Students taking the exam are expected to be present on campus with all committee members physically present. Hybrid or Remote exams are allowed by exception and approval from graduate advisor prior to the exam is required.

Normative Time to Degree
18 quarters

Graduate Program in Astronomy

The Department of Physics and Astronomy offers the M.S. and Ph.D. degrees in Astronomy.

Ongoing research in the Department of Physics and Astronomy includes observational, theoretical, and computational astrophysics and cosmology. Observational programs are carried out at UC Observatories facilities, including Lick Observatory and the W. M. Keck Observatory, as well as with other national and international ground- and space-based facilities.

Admission
Students entering the program should have completed a Bachelor's (B.S. or B.A.) or Master's degree (M.S.) in Physics, Astrophysics, Astronomy, or a closely related field from an accredited 4-year college or university. This degree must represent the completion of a program that meets the standards established by the Graduate Division at the University of California, Riverside.

International applicants are required to take the TOEFL examination as part of the pre-qualification process for admission and financial support. The scores should be submitted directly from ETS and should have a test date no older than two years from the intended date of enrollment at UCR.

Doctoral Degree

The Department of Physics and Astronomy offers the Ph.D. degree in Astronomy.

A student is recommended for advancement to candidacy for the Ph.D. degree in Astronomy upon completion of requirements (1), (2), and (3) below. The student is recommended for the Ph.D. degree upon completion of requirements (4) and (5) below.

1. **Course Work**
   Each course must be passed with a grade of "B-" or better. Each student must maintain an average of "B" or better for all courses.

   Core Courses

   PHYS 206 (Computational Astrophysics)
   PHYS 211A (Radiative Processes in Astrophysics)
   PHYS 213 (Astrophysics of the Interstellar Medium)
   PHYS 214 (Techniques of Observational Astrophysics)
   PHYS 215 (Dynamics & Evolution of Galaxies)
   PHYS 217 (Stellar Structure & Evolution)
   PHYS 219 (Cosmology & Galaxy Formation)

First-year students will also take two quarters of PHYS 297 (Directed Research), starting in the Winter quarter. The advisor for this research will be chosen by the start of the Winter quarter.

In addition, students must complete two elective graduate-level courses, taken for a letter grade. These courses must be physics or astronomy-related and relevant to the student's dissertation research. The program for each student must be approved by the Graduate Advisor and the student's Research Advisor. Such a program may entail more than the minimum number of courses and may also involve a mixture of courses from different areas.

The elective courses include the following, but other courses may be approved by the Astronomy Graduate Advisor in consultation with the Astronomy Graduate Advisory Committee:

PHYS 203 (Statistical Astronomy)
PHYS 204 (Advanced Galaxy Formation and Cosmology)
PHYS 208 (General Relativity)
PHYS 211B (Astrophysical Fluid Dynamics)
PHYS 216 (Star Formation)
PHYS 218 (Fundamentals of Astrophysics)
PHYS 226 (Cosmology, Advanced Topics)
PHYS 227 (Particle Astrophysics)
PHYS 229 (Theory of Dark Matter Halos and Galaxies)
PHYS 247 (Introduction to Applied Data Science)
PHYS 261 (Special Topics in Astrophysics)

2. **Comprehensive Examination**
   Students must have satisfactory performance on a comprehensive examination, to be taken at the end of the student's first year. In the event of a failure, a make-up exam is offered by the end of the Fall quarter of the second year. The comprehensive examination for students pursuing the Astronomy program consists of (i) a written exam covering the core courses, and (ii) an oral report on the research undertaken during the two graded research classes taken in the first year.
3. **Oral Qualifying Examination in General Area of Proposed Research**
   Students must have satisfactory performance on an oral examination in the general area of the student's proposed research. This examination is conducted by a doctoral committee, charged with general supervision of the student's research. The exam must be taken before the end of the student's third year in the program. A student who fails this examination on the first attempt may, at the discretion of the committee, be permitted to take it a second time.
4. **Dissertation**
   Doctoral candidates must complete a satisfactory written dissertation that presents a review of existing knowledge relevant to the candidate's original research, an outline of specific problems addressed by the candidate's work, and a detailed description of the strategies, analysis techniques and results of the candidate's original research. The dissertation will be reviewed by a dissertation committee, charged with general supervision of the student's research.
5. **Final Oral Examination**
   Doctoral candidates must perform satisfactorily in a final oral defense of their dissertation before the candidate's dissertation committee. The oral defense will consist of a public presentation followed by a closed-door examination period with the committee.

   A student who fails (5) on the first attempt may, at the discretion of the committee, be permitted to take it a second time.

Oral Qualifying Examination and Final Oral Examination Modality
The Oral Qualifying Exam and Final Dissertation Defense will be completed In-Person. Students taking the exam are expected to be present on campus with all committee members physically present. Hybrid or Remote exams are allowed by exception and approval from graduate advisor prior to the exam is required.

Professional Development
Students must complete PHYS 401 (Professional Development in Physics and Astronomy)

Normative Time to Degree
18 quarters

Master's Degree

A student is recommended for the degree of M.S. in Astronomy upon completion of the following requirements:

1. Satisfactory completion of the Core courses for the Doctoral Degree in Astronomy, including two quarters of PHYS 297 (Directed Research). Each course must be passed with a grade of "B-" or better. Each student must maintain an average for all courses of "B" or better.
2. Either of the following two plans:

   Plan I (Thesis)
   Satisfactory completion of a thesis in a field of astronomy to be chosen in consultation with a faculty supervisor. This thesis is approved by a committee designated by the department.

   Plan II (Comprehensive Examination)
   Satisfactory performance on the comprehensive examination.

Professional Development
Students must complete PHYS 401 (Professional Development in Physics and Astronomy)

Normative Time to Degree
6 quarters

Lower-Division Courses

Only one of the following sequences, PHYS 002A, PHYS 002B, PHYS 002C, or PHYS 040A, PHYS 040B, PHYS 040C may be taken for credit.

PHYS 002A General Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in PHYS 02LA; MATH 007A with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 09HA with a grade of C- or better or MATH 005B with a grade of C- or better. Covers topics in classical mechanics including Newton's laws of motion in one and two dimensions; gravity; work, energy, and conservation of energy; momentum and collisions; rotational motion; and orbital motion. First part of the course covers the principles of physics underlying the biological and life sciences. Credit is awarded for one of the following PHYS 002A, PHYS 02HA, PHYS 040A, PHYS 040HA, or PHYS 041A.

PHYS 002B General Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in PHYS 02LB; MATH 007B, may be taken concurrently or MATH 009B, may be taken concurrently or MATH 09HB, may be taken concurrently or MATH 005C, may be taken concurrently; PHYS 002A with a grade of C- or better or PHYS 02HA with a grade of C- or better; PHYS 02LA with a grade of C- or better or PHYS 02HLA with a grade of C- or better. Second part of the introductory course that covers the principles of physics underlying the biological and life sciences. Topics include fluids and fluid flow; thermodynamics; mechanical oscillations; sound and light waves; geometrical optics; reflection; refraction; lens; microscopy; interference; and diffraction. Credit is awarded for one of the following PHYS 002B, PHYS 02HB, PHYS 040B, PHYS 040HB, or PHYS 041B.

PHYS 002C General Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in PHYS 02LC; PHYS 002B with a grade of C- or better or PHYS 02HB with a grade of C- or better; PHYS 02LB with a grade of C- or better or PHYS 02HLB with a grade of C- or better. Third part of an introductory course covering the principles of physics underlying the biological and life sciences. Topics include electromagnetism, quantum physics, and Coulomb's Law. Covers electric field, electrical potential, resistors, capacitors, simple circuits, magnetic forces and Faraday's Law. Also addresses basic quantum physics of light, atoms, and radioactivity. Credit is awarded for one of the following PHYS 002C, PHYS 02HC, PHYS 040C, PHYS 040HC, or PHYS 041C.

PHYS 02HA Honors General Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in PHYS 02HLA; MATH 09HA with a grade of B- or better or MATH 007A with a grade of B- or better or MATH 009A with a grade of B- or better or MATH 005B with a grade of B- or better; admission to University Honors. Honors course corresponding to PHYS 002A. A limited enrollment course covering the principles of physics underlying the biological and life sciences in more depth than in PHYS 002A. Includes topics in classical mechanics; Newton's laws in one and two dimensions; gravity; work, energy, and conservation of energy; momentum and collisions; and rotational motion. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following PHYS 02HA, PHYS 002A, PHYS 040A, PHYS 040HA, or PHYS 041A.

PHYS 02HB Honors General Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in PHYS 02HLB; MATH 007B with a grade of B- or better, may be taken concurrently or MATH 009B with a grade of B- or better, may be taken concurrently or MATH 09HB with a grade of B- or better, may be taken concurrently or MATH 005C with a grade of B- or better; PHYS 002A with a grade of B- or better or PHYS 02HA with a grade of B- or better; PHYS 02LA with a grade of B- or better or PHYS 02HLA with a grade of B- or better; admission to University Honors. Honors course corresponding to PHYS 002B. Second part of a limited enrollment course in which the principles of physics underlying the biological and life sciences are covered in more depth than in PHYS 002B. Topics include fluids and fluid flow, thermodynamics, mechanical oscillations, sound and light waves, geometrical optics, reflection, refraction, lens, microscopy; interference and diffraction. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following PHYS 02HB, PHYS 002B, PHYS 040B, PHYS 040HB, or PHYS 041B.

PHYS 02HC Honors General Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in PHYS 02HLC; PHYS 002B with a grade of B- or better or PHYS 02HB with a grade of B- or better; PHYS 02LB with a grade of B- or better or PHYS 02HLB with a grade of B- or better; admission to University Honors. Honors course corresponding to PHYS 002C. A limited enrollment course covering the principles of physics underlying the biological sciences in more depth than PHYS 002B. Covers electromagnetism and quantum physics. Includes Coulomb's Law, electric field, electrical potential, resistors, capacitors, simple circuits, magnetic forces, and Faraday's Law. Also addresses basic quantum physics of light, atoms, and radioactivity. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following PHYS 02HC, PHYS 002C, PHYS 040C, PHYS 040HC, or PHYS 041C.

PHYS 02HLA Honors Genereal Physics Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in PHYS 02HA; MATH 007A with a grade of B- or better or MATH 009A with a grade of B- or better or MATH 09HA with a grade of B- or better or MATH 005B with a grade of B- or better; admission to University Honors. Honors course corresponding to PHYS 02LA. Illustrates the experimental foundations of physics presented in PHYS 02HA. Covers the basic principles of classical mechanics. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following PHYS 02HLA or PHYS 02LA.

PHYS 02HLB Honors General Physics Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in PHYS 02HB; MATH 007B with a grade of B- or better, may be taken concurrently or MATH 009B with a grade of B- or better, may be taken concurrently or MATH 09HB with a grade of B- or better, may be taken concurrently or MATH 005C with a grade of B- or better; PHYS 02HA with a grade of B- or better or PHYS 002A with a grade of B- or better; PHYS 02HLA with a grade of B- or better or PHYS 02LA with a grade of B- or better; admission to University Honors. Honors course corresponding to PHYS 02LB. Illustrates the experimental foundations of physics presented in PHYS 02HB. Topics include fluids and fluid flow, thermodynamics, mechanical oscillations, sound and light waves, geometrical optics, reflection, refraction, lens, microscopy, interference, and diffraction. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following PHYS 02HLB or PHYS 02LB.

PHYS 02HLC Honors General Physics Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in PHYS 02HC; PHYS 002B with a grade of B- or better or PHYS 02HB with a grade of B- or better; PHYS 02LB with a grade of B- or better or PHYS 02HLB with a grade of B- or better; admission to University Honors. Honors course corresponding to PHYS 02LC. Illustrates the experimental foundations of physics presented in PHYS 02HC. Covers electromagnetism and quantum physics. Includes Coulomb's Law,

electric field, electrical potential, resistors, capacitors, simple circuits, magnetic forces, and Faraday's Law. Also addresses basic quantum physics of light, atoms, and radioactivity. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following PHYS 02HLC or PHYS 02LC.

PHYS 02LA General Physics Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in PHYS 002A; MATH 007A with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 09HA with a grade of C- or better or MATH 005B with a grade of C- or better. Illustrates the experimental foundations of physics presented in PHYS 002A. Covers the basic principles of classical mechanics. Credit is awarded for one of the following PHYS 02LA or PHYS 02HLA.

PHYS 02LB General Physics Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in PHYS 002B; MATH 007B, may be taken concurrently or MATH 009B, may be taken concurrently or MATH 09HB, may be taken concurrently or MATH 005C, may be taken concurrently; PHYS 002A with a grade of C- or better or PHYS 02HA with a grade of C- or better; PHYS 02LA with a grade of C- or better or PHYS 02HLA with a grade of C- or better. Illustrates the experimental foundations of physics presented in PHYS 002B. Topics include fluids and fluid flow; thermodynamics; mechanical oscillations; sound and light waves; geometrical optics; reflection; refraction; lens; microscopy; interference; and diffraction. Credit is awarded for one of the following PHYS 02LB or PHYS 02HLB.

PHYS 02LC General Physics Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in PHYS 002C; PHYS 002B with a grade of C- or better or PHYS 02HB with a grade of C- or better; PHYS 02LB with a grade of C- or better or PHYS 02HLB with a grade of C- or better. Illustrates the experimental foundations of physics presented in PHYS 002C. Topics include electromagnetism, quantum physics, and Coulomb's Law. Covers electric field, electrical potential, resistors, capacitors, simple circuits, magnetic forces, Faraday's Law. Also addresses basic quantum physics of light, atoms, and radioactivity. Credit is awarded for one of the following PHYS 02LC or PHYS 02HLC.

PHYS 005 History of the Universe 4 Lecture, 3 hours; discussion, 1 hour. An introduction to "The Big Bang" model and its observational tests. Topics include dark energy, dark matter, rapid growth of universe at early times, leftover radiation from "The Big Bang", galaxy formation, bending of light by gravity, black holes, extraterrestrial life, and the likely fate of the universe.

PHYS 006 The Violent Universe 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to violent phenomena that power the universe, specifically phenomena that illustrate basic astrophysical principles. Topics include impacts in our planetary system: explosions of stars, bursts of star formation, galaxy collisions, black holes, quasars, cosmic jets, and the "Big Bang."

PHYS 007 Space Time, Relativity, and Cosmology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A non-mathematical presentation on gravity, understanding of the universe, and how present theories originated. Topics include the ancient Greeks, Galileo, Newton, the speed of light, Einstein's special and general relativity, the lifetimes of stars, supernovas, gravitational waves, the Big Bang, cosmic inflation, and the multiverse.

PHYS 008 Color and Sound: Dimensions in Communication 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Discusses the interplay between visual and aural sensory experiences and the physical principles of light and sound. Topics include visual perception and pattern recognition; the color spectrum; optical instruments; anatomy of the camera and the eye; lasers and holography; vibrations and sound waves; acoustics; reverberation; and sound production in speech, music, and high-fidelity audio devices. Involves demonstrations and illustrations.

PHYS 010 How Things Work 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Surveys the physical basis of modern technology emphasizing electronics and electrical devices. Topics include electro- and magneto-statics and dynamics (xerographic copiers, magnetic levitation, electrical power distribution); communication (radio, TV, computers, tape recorders, CD players); and imaging (cameras, DVD players, x rays, magnetic resonance imaging).

PHYS 016 Principles of Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005A is recommended. Topics include classical laws of motion, force, energy, electricity and magnetism, properties of matter, atomic structure, waves, sound, light, heat, the Earth, and the solar system and universe. Includes demonstrations and visual illustrations. Not open to students with credit or concurrent enrollment in PHYS 002A or PHYS 02HA or PHYS 002B or PHYS 02HB or PHYS 002C or PHYS 02HC or PHYS 040A or PHYS 040HA or PHYS 040B or PHYS 040HB or PHYS 040C or PHYS 040HC or PHYS 040D or PHYS 040E.

PHYS 017 Linear Algebra For Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of C- or better. This course covers the essential mathematics for quantum mechanics at the upper-division level. It applies linear algebra finite and infinite dimensional vector spaces. Topics include matrices, linear equations, bases, eigenvectors and eigenvalues, functions as infinite-dimensional vectors, differential operators as matrices, Fourier transforms, and eigenfunctions of common differential operators.

PHYS 018 Energy and the Environment 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers the physics of energy (thermal, kinetic, potential, chemical, nuclear), its storage and use, primary sources of energy (fossil fuel, nuclear, wind, solar) and their relative effects on the environment. Particular emphasis on determining individual carbon footprints, physical models of global climate change and identifying pathways toward a sustainable infrastructure.

PHYS 020 Exploring the Universe: An Adventure in Astronomy 4 Lecture, 3 hours; workshop, 3 hours. Prerequisite(s): none. An astronomy course for non-science students. The excitement of an evolving and sometimes violent universe of stars and galaxies is explored in a descriptive manner. Here, the union of modern and ancient observations with astrophysical laws will provide a sophisticated but by no means complete picture of the universe. Special topics such as Astrology and Extraterrestrial Life will be discussed.

PHYS 024 Dna in Your Life: the Physical Basis For Structure, Function, and Control 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to various medical, biological, and commercial aspects of physical DNA science.

PHYS 037 The Origins 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none Explores the most fundamental questions in cosmology, physics, and chemical sciences through their origins. Topics include the origin of the Universe, origin of matter, first generation of stars and galaxies, origin of chemical elements, chemistry of life, and astrobiology.

PHYS 039 Adventures in Physics 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Physics; or consent of instructor. Covers professional development including career options for physics majors and provides pathways to undergraduate research opportunities. Includes aspects of physics relevant to current social and political issues.

PHYS 040A General Physics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 005B with a grade of C- or better or MATH 007A with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 09HA with a grade of C- or better; MATH 007B with a grade of C- or better, may be taken concurrently or MATH 009B with a grade of C- or better, may be taken concurrently or MATH 09HB with a grade of C- or better, may be taken concurrently or MATH 005C with a grade of C- or better, may be taken concurrently. Explores topics in classical mechanics with gravity including Newton's laws of motion; gravity; friction; circular motion; work, energy, and conservation of energy; collisions; rigid-body motion; torque; and angular momentum. Provides laboratory exercises illustrating experimental foundations of physical principles and selected applications. For engineering and physical science majors. Credit is awarded for one of the following PHYS 040A, PHYS 002A, PHYS 02HA, PHYS 040HA, or PHYS 041A.

PHYS 040B General Physics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 009C with a grade of C- or better, may be taken concurrently or MATH 09HC with a grade of C- or better,

may be taken concurrently or MATH 005C with a grade of C- or better, may be taken concurrently; PHYS 040A with a grade of C- or better or PHYS 040HA with a grade of C- or better. Topics include fluids; mechanical oscillations; sound waves and light waves; ray optics; temperature; heat; kinetic theory of gases; the laws of thermodynamics; and heat engines. Provides laboratory exercises illustrating the experimental foundations of physical principles and selected applications. For engineering and physical science majors. Credit is awarded for one of the following PHYS 040B, PHYS 002B, PHYS 02HB, PHYS 040HB, or PHYS 041B.

PHYS 040C General Physics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 009C with a grade of C- or better or MATH 09HC with a grade of C- or better or MATH 005C with a grade of C- or better; PHYS 040B with a grade of C- or better or PHYS 040HB with a grade of C- or better. Covers electromagnetism and a brief introduction to applications-based quantum physics. Topics include electric force, fields, potential; Gauss' law; magnetic fields; Ampere's law; Faraday's law; electromagnetic waves; dc circuits; concept of photon, matter waves, energy levels, and radioactivity. Laboratory exercises illustrate experimental foundations and applications. For engineering and physical science majors. Credit is awarded for one of the following PHYS 040C, PHYS 002C, PHYS 02HC, PHYS 040HC, or PHYS 041C.

PHYS 040D General Physics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): PHYS 040C or PHYS 040HC with a grade of "C-" or better or consent of instructor. For engineering and physical sciences students. Topics in electromagnetic waves including Maxwell's equations; geometrical optics; optical instruments, cavities, and waveguides; interference, diffraction, and polarization; and special theory of relativity. Laboratories provide exercises illustrating the experimental foundations of physical principles and selected applications. Credit is not awarded for PHYS 040D if it has already been awarded for PHYS 002C or PHYS 041C.

PHYS 040E General Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 046 (may be taken concurrently); PHYS 040D with a grade of "C-" or better. For engineering and physical sciences students. Covers topics in modern physics including the quantum theory of light and particles; quantum mechanics in one and three dimensions; tunneling phenomena; the hydrogen atom; statistical physics; lasers; molecular structure; and solid state, nuclear, and particle physics. Credit is not awarded for PHYS 040E if it has already been awarded for PHYS 002C or PHYS 02HC or PHYS 041C.

PHYS 040HA Honors General Physics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 007A with a grade of B- or better or MATH 009A with a grade of B- or better or MATH 009HA with a grade of B- or better or MATH 007B with a grade of B- or better, may be taken concurrently or MATH 009B with a grade of B- or better, may be taken concurrently or MATH 09HB with a grade of B- or better, may be taken concurrently or MATH 005C with a grade of B- or better, may be taken concurrently; admission to University Honors. Honors course corresponding to PHYS 040A. Explores topics in classical mechanics with gravity including Newton's laws of motion; gravity; friction; circular motion; work, energy, and conservation of energy; collisions; rigid-body motion; torque; and angular momentum. Provides laboratory exercises illustrating experimental foundations of physical principles and selected applications. For engineering and physical science majors. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following PHYS 040HA, PHYS 002A, PHYS 02HA, PHYS 040A, or PHYS 041A.

PHYS 040HB Honors General Physics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 009C with a grade of B- or better, may be taken concurrently or MATH 09HC with a grade of B- or better, may be taken concurrently or MATH 005C with a grade of B- or better, may be taken concurrently; PHYS 040A with a grade of B- or better or PHYS 040HA with a grade of B- or better; admission to University Honors. Honors course corresponding to PHYS 040B. Topics include fluids; mechanical oscillations; sound waves and light waves; ray optics; temperature; heat; kinetic theory of gases; the laws of thermodynamics; and heat engines. Provides laboratory exercises illustrating the experimental foundations of physical principles and selected applications. For engineering and physical science majors. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following PHYS 040HB, PHYS 002B, PHYS 02HB, PHYS 040B, or PHYS 041B.

PHYS 040HC Honors General Physics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 009C with a grade of B- or better or MATH 09HC with a grade of B- or better or MATH 005C with a grade of B- or better; PHYS 040B with a grade of B- or better or PHYS 04HB with a grade of B- or better; admission to University Honors. Honors course corresponding to PHYS 040C. Covers electromagnetism and a brief introduction to applications-based quantum physics. Topics include electric force, fields, potential; Gauss' law; magnetic fields; Ampere's law; Faraday's law; electromagnetic waves; dc circuits; concept of photon, matter waves, energy levels, and radioactivity. Laboratory exercises illustrate experimental foundations and applications. For engineering and physical science majors. Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following PHYS 040HC, PHYS 002C, PHYS 02HC, PHYS 040C, or PHYS 041C.

PHYS 041A Introductory Physics For Physics Majors 8 Lecture, 4 hours; discussion, 2 hours; laboratory, 6 hours. Prerequisite(s): MATH 007A with a grade of C- or better, may be taken concurrently or MATH 09HA with a grade of C- or better, may be taken concurrently or MATH 009A with a grade of C- or better, may be taken concurrently or MATH 005B with a grade of C- or better, may be taken concurrently. Covers topics in classical mechanics including Newton's laws of motion in one and two dimensions; work, energy, and conservation of energy; momentum and collisions; rotational motion; and orbital motion. Credit is awarded for one of the following PHYS 041A, PHYS 002A, PHYS 02HA, PHYS 040A, or PHYS 040HA. No change

PHYS 041B Introductory Physics For Physics Majors 8 Lecture, 4 hours; discussion, 2 hours; laboratory, 6 hours. Prerequisite(s): MATH 007B with a grade of C- or better, may be taken concurrently or MATH 009B with a grade of C- or better, may be taken concurrently or MATH 09HB with a grade of B or better, may be taken concurrently or MATH 005C with a grade of C- or better, may be taken concurrently; PHYS 002A with a grade of B- or better or PHYS 040A with a grade of C- or better or PHYS 041A with a grade of C- or better. Covers relativity oscillations, mechanical waves, fluids, electrostatics, magnetism, and circuits. Credit is awarded for one of the following PHYS 041B, PHYS 040C, or PHYS 040HC. No change

PHYS 041C Introductory Physics For Physics Majors 8 Lecture, 4 hours; discussion, 2 hours; laboratory, 6 hours. Prerequisite(s): MATH 009C with a grade of C- or better, may be taken concurrently or MATH 09HC with a grade of C- or better, may be taken concurrently or MATH 005C with a grade of C- or better, may be taken concurrently; PHYS 002B with a grade of B- or better or PHYS 02HB with a grade of B- or better or PHYS 040C with a grade of C- or better or PHYS 040HC with a grade of B- or better or PHYS 041B with a grade of C- or better; or consent of instructor. Covers electromagnetism, geometric and wave optics, and modern physics. Credit is awarded for one of the following PHYS 041C, PHYS 002C, PHYS 02HC, or PHYS 040HC. No chnage

PHYS 050 Introduction to Applied Data Science: A Multi-Disciplinary Approach 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces students from different disciplines (physical, biological, engineering, finance, economy, humanities) to data science techniques and applications. Provides background knowledge in data science and prepares for a career in this field. Provides basic knowledge to continue on to more advanced topics in data science and apply it to practical problems.

PHYS 097 Lower-Division Research 1 to 4 Individual Study, 3 to 12 hours. Prerequisite(s): consent of instructor. Special research projects in physics performed under the supervision of a member of the staff. This course may not be used to satisfy the undergraduate unit requirements in the major. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

Upper-Division Courses

PHYS 111 Astrophysics and Stellar Astronomy 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B, MATH 046, or equivalents; one of the following: PHYS 040D with a grade of C- or better, PHYS 041C with a grade of C- or better, PHYS 002C with a grade of B- or better. Covers stellar interiors, radiations, and evolution; the origin of the elements; particle and electromagnetic radiation; pulsars, quasars, and other unusual objects; and galactic structure and cosmology.

PHYS 112 Galaxies and Extragalactic Astronomy 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 111 with a grade of C- or better. Topics include the structure of the Milky Way, the observed properties of galaxies, active galactic nuclei and supermassive black holes, the intergalactic medium, the theory of galaxy formation and evolution, galaxy clusters, and the large scale structure of our universe.

PHYS 117 Advanced Mathematical Methods of Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of C- or better, MATH 046 with a grade of C- or better. This course covers advanced mathematical for upper division and graduate physics courses. Topics include dimensional analysis, infinite dimensional vector spaces, integral transforms, complex analysis, and the use of Green's functions to solve inhomogeneous differential equations. This course is strongly recommended for students with a focus on theoretical physics.

PHYS 130A Classical Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C, MATH 010A (may be taken concurrently); one of the following: PHYS 002A or PHYS 02HA with a grade of B- or better, PHYS 040A or PHYS 040HA with a grade of C- or better, PHYS 041A with a grade of C- or better. Explores vector calculus, single-particle motion, oscillations, Lagrangian and Hamiltonian dynamics, central-forces motion, and celestial mechanics.

PHYS 130B Classical Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010A, MATH 010B (may be taken concurrently), PHYS 130A. Topics include dynamics of a system of particles, motion in non-inertial reference systems, dynamics of rigid bodies, coupled oscillations, and special theory of relativity.

PHYS 132 Thermal Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B; MATH 046 (may be taken concurrently); PHYS 130B. Covers thermodynamics and an introduction to statistical mechanics. Topics include states of a model system; entropy and temperature; the Boltzmann distribution and Helmholtz free energy; thermal radiation and the Planck distribution; chemical potential; the ideal gas; Fermi and Bose gasses; and heat and work.

PHYS 133 Advanced Statistical Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 132 and PHYS 156B. Covers advanced topics in statistical mechanics, ensembles, and classical and quantum statistical mechanics. Explores the connection between statistical mechanics and thermodynamics.

PHYS 135A Electromagnetism 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B; MATH 046; one of the following: PHYS 002B or PHYS 02HB with B- or better, PHYS 040C or PHYS 040HC with a C- or better, PHYS 041B with a C- or better. Topics include vector calculus; Coulomb's law and the electric field; Gauss' law; scalar potential; conductors in electrostatic fields; electrostatic energy; electric multipoles; boundary conditions; electrostatics in the presence of matter; and special methods in electrostatics.

PHYS 135B Electromagnetism 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 135A. Topics include electric currents and circuits, Ampere's law, the magnetic field, the integral form of Ampere's law, the vector potential, Faraday's law of induction, magnetic energy, magnetic multipoles, magnetism in the presence of matter, Maxwell's equations, and plane waves.

PHYS 136 Electromagnetic Waves 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 135B. Covers Maxwell's equations; propagation of electromagnetic waves in wave guides, coaxial lines, and optical fibers; reflection, refraction, and diffraction of waves; dispersion of waves in gases and plasmas; interference and coherence and their role in holography; electromagnetic radiation from charged particles, antennas, masers, and lasers; and relativistic electrodynamics.

PHYS 139L Electronics For Scientists 5 Lecture, 3 hours; laboratory, 6 hours. Prerequisite(s): One of the following: PHYS 002B or PHYS 02HB with B- or better, PHYS 040C or PHYS 040HC with a C- or better, PHYS 041B with a C- or better, or consent of instructor. Introduces basic analog and digital circuit designs that emphasize practical applications. Includes properties of diodes and transistors; operational amplifiers for use as amplifiers, oscillators, and function generators; properties and use of logic gates, counters, and timers; data storage and synchronization; multiplexer and decoder applications; microprocessor functions; and computer interfacing.

PHYS 140L Techniques of Observational Astronomy 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): PHYS 002C with a grade of B- or better or PHYS 02HC with a grade of B- or better or PHYS 040E with a grade of C- or better or PHYS 041C with a grade of C or better; restricted to major(s) Physics; or consent of instructor. Covers modern techniques of observational astronomy including digital optical imaging, photometry, spectroscopy, radio observations, error propagation and statistical inference. Lab practicum includes calibrating digital images and spectra, computer programming for data analysis, quantifying uncertainties in astronomical measurements, and written communication of scientific results.

PHYS 142L Advanced Physics Laboratory 4 Laboratory, 12 hours. Prerequisite(s): PHYS 002C with a grade of B- or better or PHYS 02HC with a grade of B- or better or PHYS 040E with a grade of C- or better or PHYS 41C with a grade of C- or better; restricted to class level standing of senior; restricted to major(s) Physics; or consent of instructor. A capstone experience consisting of experiments chosen from areas in contemporary physics. Course is repeatable to a maximum of 8 units. Credit is awarded to a maximum of 10 units for either or both PHYS 142L and/or PHYS 142W.

PHYS 142W Advanced Physics Laboratory 5 Laboratory, 11 hours; individual study, 6 hours; workshop, 0.8 hour. Prerequisite(s): concurrent enrollment in WRIT 040S; PHYS 002C with a grade of B- or better or PHYS 02HC with a grade of B- or better or PHYS 040E with a grade of C- or better or PHYS 041C with a grade of C- or better; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; restricted to class level standing of senior; or consent of instructor. A capstone experience consisting of experiments chosen from areas in contemporary physics. Includes writing instruction with an emphasis on technical communication. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to WRIT 030. Course is repeatable to a maximum of 10 units. Credit is awarded to a maximum of 10 units for either or both PHYS 142L or PHYS 142W.

PHYS 145A Biophysics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 001C or CHEM 01HC; MATH 010B; MATH 046; one of the following: PHYS 002C or PHYS 02HC with B- or better, PHYS 041C with a C- or better, PHYS 040E with a C- or better. Covers physical modeling of the structure of proteins; protein folding; structure of nucleic acids; electrostatic potential of DNA; dynamics of biomolecules; structure of a biological cell; osmotic pressures of cells; non-equilibrium thermodynamics; and biochemical reactions.

PHYS 145B Biophysics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 145A; BCH 100 or BCH 110B or BCH 110HB; or consent of instructor. Covers conformation of biopolymers, intermolecular forces, dynamics of biopolymers, Brownian motion, biopolymers as polyelectrolytes, electrolytic solutions, and the Debye-Huckel theory.

PHYS 145C Biophysics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 145B or consent of instructor. Examines stochastic thermodynamics; the Fluctuation Theorems and the Jarzynski relation; protein and RNA denaturation; tests of the Jarzynski relation; chemical forces and self-assembly; enzymes and molecular machines; survey of molecular devices found in cells; and kinetics of real enzymes and machines.

PHYS 150A Introduction to Condensed Matter Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): One of the following: PHYS 002B with B- or better, PHYS 040E with

a C- or better, PHYS 041C with a C- or better; or consent of instructor. Covers properties of systems composed of many atoms arranged in a periodic lattice. Topics include crystal structure, symmetry, and diffraction; crystal cohesion; lattice dynamics; thermal properties; metallic properties and the Fermi surface; band theory of metals and semiconductors; and collective excitations.

PHYS 150B Introduction to Condensed Matter Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 150A. Covers properties of systems composed of many atoms arranged in a periodic lattice. Topics include superconductivity; magnetism; non-crystalline solids; defects in solids; surface and interface physics; and alloys.

PHYS 151 Topics in Modern Condensed Matter Research 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): One of the following: PHYS 002B or BCH 110HB with a grade of "B-" or better, PHYS 040E with a C- or better, PHYS 041C with a grade of "C-" or better. Consent of instructor is required for students repeating the course. Introduces cutting-edge physics research being conducted in laboratories and institutes around the world. Focuses on a single research area (e.g., nanoscale physics, biological physics) that may change each quarter. Includes experimental methods and theoretical concepts. Course is repeatable as content changes to a maximum of 12 units.

PHYS 152A Exploring Many-Body Quantum Physics With Mathematica 2 Lecture, 2 hours. Prerequisite(s): MATH 046; one of the following: PHYS 002C with a B- or better, PHYS 040E with a C- or better, PHYS 041C with a C- or better; or consent of instructor. MATH 031 is recommended. An introduction to numerics and visualization using Mathematica. Topics include random numbers and stochastic processes; time-dependent and stationary equations in matrix form; single-particle tight-binding model; single-spin dynamics; pure and mixed states; spin echo; the direct product of matrices; many-body quantum mechanics; and quantum spin chains.

PHYS 152B Exploring Many-Body Quantum Physics With Mathematica 2 Lecture, 2 hours. Prerequisite(s): PHYS 152A or consent of instructor. Covers the symmetry of many-body wavefunction, including bosons and fermions; secondary quantization; harmonic oscillators; ladder operators, eigenvalues, and eigenfunctions; interacting many-body systems; mean field approximation; and density matrix of a subsystem and decoherence.

PHYS 156A Quantum Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B, MATH 046, PHYS 130B; one of the following: PHYS 002C or PHYS 02HC with a grade of "B-" or better, PHYS 040E with a grade of "C-" or better, PHYS 041C with a grade of "C-" or better. Topics include wave-particle duality, the Schrodinger equation, superposition, the uncertainty principle, and one-dimensional harmonic oscillator.

PHYS 156B Quantum Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 156A. Topics include the hydrogen atom, angular momentum and spin representations, many-electron systems, the Pauli exclusion principle, and perturbation theory.

PHYS 156C Quantum Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 156B. Applications in quantum mechanics. Includes perturbation theory and other approximations, scattering, and an introduction to advanced topics such as relativistic quantum mechanics.

PHYS 160 Introduction to Quantum Computation 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 002C with a grade of B- or better or PHYS 02HC with a grade of B- or better or PHYS 040C with a grade of C- or better or PHYS 041C with a grade of C- or better; or consent of instructor. Topics include the basic concepts of quantum mechanics; entanglement; Bell's inequalities; quantum circuits; Deutsch's and Shor's algorithms; and quantum error correction.

PHYS 163 Atomic Physics and Spectroscopy 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 113 or PHYS 156A with a C- or better, PHYS 135A with a C- or better, or consent of instructor. Covers the role of atomic physics and spectroscopy in the development of quantum mechanics; Bohrs old quantum theory; Heisenbergs matrix mechanics; Schrodingers wave mechanics; Dirac equation; the g-factor; Zeeman effect and the Darwin term; Spin-orbit coupling and Thomas precession; Dirac hydrogen atom; Fine structure; Hyperfine structure; Lamb shift.

PHYS 164 Introduction to Nuclear Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): One of the following: PHYS 002C or PHYS 02HC with a grade of "B-" or better, PHYS 040E with a grade of "C-" or better, PHYS 041C with a grade of "C-" or better. Addresses the basic nuclear properties, as well as the nuclear building blocks and structure. Explores radioactivity, nuclear interactions, the strong force, the confinement and chiral phase transitions, the quantum chromodynamics (QCD) vacuum, and matter at extreme temperatures and densities.

PHYS 165 Introduction to Particle Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 156A. Explores the classification of particles in terms of the Standard Model. Includes methods and techniques for particle acceleration and detection; conservation laws and symmetries; the basic interactions of particles (electromagnetic, strong, weak); and electroweak unification.

PHYS 166 Cosmology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 156A. Discusses current topics in astrophysics and cosmology from the perspective of elementary particle physics. Topics include the development and structure of the early universe, dark matter and dark energy, cosmic radiation, and particle physics in the stars.

PHYS 168 Energy and the Environment 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B with a grade of C- or better, PHYS 040C with a grade of C- or better or PHYS 041C with a grade of C- or better; or consent of instructor. Explores physical insights into primary energy uses in society such as electricity, transportation, and heating. Explains how that energy is obtained and transformed (e.g., fossil fuels, nuclear, hydropower, heat engines). Also addresses renewable energy (photovoltaics, wind, batteries, fuel cells) in the context of climate change and sustainability.

PHYS 177 Computational Methods For Physical Sciences 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CS 009A or CS 010A or CS 010B; PHYS 002C with a grade of B- or better or PHYS 02HC with a grade of B or better or PHYS 040E with a grade of C- or better or PHYS 041C with a grade of C- or better; or consent of instructor. Covers computer applications for solving problems in physical sciences. Addresses symbolic manipulation languages such as Mathematica, mathematical operations, plotting, and symbolic and numerical techniques in calculus. Includes numerical methods such as histogramming, the Monte-Carlo method for modeling experiments, statistical analysis, curve fitting, and numerical algorithms.

PHYS 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): consent of department chair Individual study to meet special curricular needs. May not be used to satisfy major requirements unless taken as a replacement for a course not being offered during the student's remaining tenure. Course is repeatable to a maximum of 9 units; a maximum of 5 units may be used to substitute for PHYS 142L.

PHYS 190L Special Studies at Los Alamos National Laboratory 1 to 8 Individual Study, 3 to 24 hours. Prerequisite(s): admission to the UCR/LANL Educational Internship Program; consent of advisor and department chair. Individual study to meet special curricular needs. Course is repeatable to a maximum to 16 units.

PHYS 195A Senior Thesis 1 to 4 Thesis, 3 to 12 hours; Prerequisite(s): senior standing; consent of instructor. A thesis written on research conducted under the supervision of a faculty member. May be undertaken as a one-, two-, three-, or four-quarter course (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D). Total credit awarded for PHYS 195A plus PHYS 195B plus PHYS 195C plus PHYS 195D may not exceed 8 units; a maximum of 4 units may be used to satisfy the unit requirement for the major, and a maximum of 5 units of any combination of PHYS 195A, PHYS 195B, PHYS 195C, and PHYS 195D may be used to substitute for PHYS 142L. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned; a Satisfactory (S) or No Credit (NC) grade is awarded unless the course is taken to substitute for PHYS 142L.

PHYS 195B Senior Thesis 1 to 4 Thesis, 3 to 12 hours. Prerequisite(s): senior standing; consent of instructor; PHYS 195A. A thesis written on research conducted under the supervision of a faculty member. May be undertaken as a one-, two-, three-, or four-quarter course (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D). Total credit awarded for PHYS 195A plus PHYS 195B plus PHYS 195C plus PHYS 195D may not exceed 8 units; a maximum of 4 units may be used to satisfy the unit requirement for the major, and a maximum of 5 units of any combination of PHYS 195A, PHYS 195B, PHYS 195C, and PHYS 195D may be used to substitute for PHYS 142L. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned; a Satisfactory (S) or No Credit (NC) grade is awarded unless the course is taken to substitute for PHYS 142L.

PHYS 195C Senior Thesis 1 to 4 Thesis, 3 to 12 hours. Prerequisite(s): senior standing; consent of instructor; PHYS 195B. A thesis written on research conducted under the supervision of a faculty member. May be undertaken as a one-, two-, three-, or four-quarter course (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D). Total credit awarded for PHYS 195A plus PHYS 195B plus PHYS 195C plus PHYS 195D may not exceed 8 units; a maximum of 4 units may be used to satisfy the unit requirement for the major, and a maximum of 5 units of any combination of PHYS 195A, PHYS 195B, PHYS 195C, and PHYS 195D may be used to substitute for PHYS 142L. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned; a Satisfactory (S) or No Credit (NC) grade is awarded unless the course is taken to substitute for PHYS 142L

PHYS 195D Senior Thesis 1 to 4 Thesis, 3 to 12 hours. Prerequisite(s): senior standing; consent of instructor; PHYS 195C. A thesis written on research conducted under the supervision of a faculty member. May be undertaken as a one-, two-, three-, or four-quarter course (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D). Total credit awarded for PHYS 195A plus PHYS 195B plus PHYS 195C plus PHYS 195D may not exceed 8 units; a maximum of 4 units may be used to satisfy the unit requirement for the major, and a maximum of 5 units of any combination of PHYS 195A, PHYS 195B, PHYS 195C, and PHYS 195D may be used to substitute for PHYS 142L. Graded In Progress (IP) until the last quarter is completed, at which time a final grade is assigned; a Satisfactory (S) or No Credit (NC) grade is awarded unless the course is taken to substitute for PHYS 142L.

PHYS 197 Research For Undergraduates 1 to 4 Individual Study, 3 to 12 hours. Prerequisite(s): upper-division standing and consent of instructor. Special research projects in physics performed under the supervision of a member of the staff. This course may not be used to satisfy the undergraduate unit requirement in the major. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

PHYS 198I Individual Internship in Physics 1 to 12 Written Work, 1 to 12 hours; internship, 2 to 24 hours. Prerequisite(s): upper-division standing; consent of department chair. Provides experience as a practicing scientist in a government or industrial laboratory. Includes joint supervision by an off-campus sponsor and a Physics faculty member. Course is repeatable to a maximum of 12 units; a maximum of 4 units may be used to satisfy major requirements, and a maximum of 5 units may be used to substitute for PHYS 142L.

Graduate Courses

PHYS 202 Interdisciplinary Overview of Current Issues in Semiconductor Processing 3 Lecture, 3 hours. Prerequisite(s): graduate standing in Chemistry, Physics, Engineering, or a related subject or consent of instructor. An interdisciplinary overview of present-day semiconductor processing. Introduces topics such as properties of semiconductors, cleanroom environment, epitaxy, ion implantation, etching, lithography, device architecture, testing, and fault detection. May offer field trips. Cross-listed with CHEM 208, and MSE 245D.

PHYS 203 Statistical Astronomy 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 218. Introduces statistical methods needed to analyze astronomical data. Provides case examples of problems in observational astronomy and applies statistical techniques to solve them. Covers probability, correlation and association, hypothesis testing, data modelling, maximum likelihood technique, detection and surveys, sequential data, and surface distribution. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 204 Advanced Galaxy Formation and Cosmology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 218; PHYS 219; graduate standing; or the consent of instructor. Covers topics on galaxy formation, star formation in galaxies, intergalactic medium, first generation of stars and galaxies, high redshift Universe, reionization, evolution of galaxies and stellar population, and number counts. Also covers luminosity functions, correlation functions, and clustering. Introduces new techniques and latest data sets and archives used for research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 205 Classical Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in Physics. Covers the Lagrangian formulation, calculus of variations, Hamilton's principle, conservation principles and symmetry properties, the two-body central force problem, the Kepler problem, and scattering. Also examines orthogonal transformations, rigid body motion, the inertia tensor, Euler's equations, Hamiltonian formulation, canonical transformations, and complex integration.

PHYS 206 Computational Astrophysics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduction to computational astrophysics emphasizing numerical simulations and their application to astrophysical problems. Topics include numerical simulation data products, generation of initial conditions, N-body techniques, hydrodynamical techniques, and data visualization.

PHYS 208 General Relativity 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 205; graduate standing; or consent of instructor. An introduction to general relativity. Covers tensors, covariant derivatives, the Riemann curvature tensor, and Einstein's equation. Explores the Schwartzchild and Kerr black hole metrics and wormholes. Also addresses gravitational waves and their detection. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 209A Quantum Electronics 4 Lecture, 4.5 hours. Prerequisite(s): PHYS 135B, PHYS 156A; or consent of instructor. Quantum theory of light and interaction of light with atoms. Density matrix formulation of atomic susceptibility. Propagation of light in matter and optical waveguides. Optical resonators. Theory and operation of common lasers. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 209B Nonlinear Optics 4 Lecture, 4.5 hours. Prerequisite(s): PHYS 209A or consent of instructor. Wave propagation in nonlinear media. Electro-optic effect, three- and four-wave mixing, high-resolution nonlinear spectroscopies, rare atom and molecule detection, laser manipulation of particles, high-intensity laser physics, laser-plasma interactions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 209C Advanced Topics in Quantum Optics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 209A, PHYS 209B; graduate standing; or consent of instructor. Advanced topics in quantum optics and nonlinear optics. Topics include high resolution spectroscopy, atom trapping and manipulation, transient and time-resolved spectroscopy, coherent spectroscopy, GHz to X-ray sources and spectroscopy and coherent control in atoms, molecules, liquids, solids, surfaces and interfaces. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topics change to a maximum of 12 units.

PHYS 210A Electromagnetic Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Covers topics in electrostatics, including Coulomb potential, boundary value problems, multipoles, and dielectric media. Also addresses Laplace's equation and Green's function in Cartesian, spherical, and cylindrical coordinates.

PHYS 210B Electromagnetic Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 210A; graduate standing; consent of instructor. Covers topics

in electromagnetism. Includes magnetostatics, quasistationary electromagnetism, Maxwell's equations, gauge transformations, Maxwell's stress tensor, analyticity of dielectric susceptibility, and electromagnetic waves in uniform media and waveguides.

PHYS 210C Electromagnetic Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 210B or consent of instructor. Covers electromagnetic radiation and scattering; propagation of electromagnetic fields in non-uniform media (geometrical optics, interference, and diffraction); special theory of relativity; Lagrangian formalism; and dynamics of relativistic particles in external fields. Also examines Cherenkov radiation and magnetic monopoles.

PHYS 211A Radiative Processes in Astrophysics 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 135A, PHYS 135B, PHYS 136, PHYS 156A, PHYS 156B. Radiative transfer of continuum and line radiation, Einstein coefficients, photoionization equilibria, radiation by free electrons, bremsstrahlung and synchrotron emission, Compton and inverse Compton scattering, wave propagation through magnetized plasmas, atomic and molecular structure and spectra, atomic fine structure, and molecular hyperfine lines. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 211B Astrophysical Fluid Dynamics 4 Lecture, 3; consultation, 1 hour. Prerequisite(s): PHYS 211A. Covers hydrodynamics, sound waves, turbulence, supersonic turbulence, magnetohydrodynamics, Alfven waves, extragalactic relativistic jets, supersonic jets, galactic spiral structure and density-wave theory, accretion disk theory, Balbus-Hawley instability, and stellar winds. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 212A Thermodynamics and Statistical Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Covers thermodynamics, statistical mechanics, ideal Bose systems, ideal Fermi systems, and bulk motion. Cross-listed with MSE 204.

PHYS 212B Thermodynamics and Statistical Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MSE 204/ PHYS 212A; graduate standing; consent of instructor. Addresses functional integrals and approximation techniques. Provides an introduction to phase transitions and the renormalization group.

PHYS 213 Astrophysics of the Interstellar Medium 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. An overview of the interstellar medium and relevant physical processes. Covers the structure and evolution of ionized hydrogen regions associated with massive stars and supernovae. Also addresses the neutral and ionized phases of the interstellar medium, as well as cooling processes. Includes the interpretation of spectral lines. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 214 Techniques of Observational Astrophysics 4 Lecture, 2 hours; laboratory, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing. An introduction to the basic tools of observational astronomy. Topics include astronomical telescopes and detectors, observing techniques, calibration, and error analysis. Students whose research is related to astronomy receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

PHYS 215 Dynamics and Evolution of Galaxies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. Discusses the structure, stability, and dynamic and cosmologic evolution of galaxies. Interprets observational data on galaxies within a coherent theoretical framework. Topics include potential theory, orbits, collisionless systems, and the structure and evolutionary history of galaxies. Students whose research is related to astronomy receive a letter grade other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

PHYS 216 Star Formation 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. Discusses the processes involved in the formation of stars: the initial conditions in the interstellar medium that leads to star formation and the formation of planets and planetary systems around young stars. Topics include molecular cloud formation, the properties of young stars, jets and outflows, massive stars, and cosmological star formation. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 217 Stellar Structure and Evolution 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. Topics include physics of stellar structure and main sequence evolution, and energy production and transport; post main sequence evolution through the giant stage and the formation of compact objects; supernovae, nucleosynthesis, pulsars, and the roll of accretion within the framework of stellar evolution; and the physics of white dwarfs, neutron stars, and black holes. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 218 Fundamentals of Astrophysics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Develops basic astrophysical concepts from fundamental physics. Topics include nucleosynthesis, stellar structure, evolution of stars of different masses, end-states of stars, and bremsstrahlung and synchrotron radiation. Also covers cross-sections, opacities, hydrogen atom transitions, forbidden lines, and molecular lines. Addresses the ongoing search of life in the Universe. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 219 Cosmology and Structure Formation 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or the consent of instructor. Explores cosmology, models for the universe, galaxy formation scenarios, evolution of galaxies and stellar population, and number counts. Also covers star formation activity in the universe, cosmic background radiation, dark matter, and dark energy. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 220 Quantum Computing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): EE 201/MSE 207 or equivalent; graduate standing or consent of instructor. An introduction to quantum computing. Topics include qubits, entanglement, quantum gates, quantum circuit diagrams, simple quantum algorithms, quantum teleportation, quantum cryptography, Shor's factorization algorithm, Grover's search algorithm, and quantum error correction. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with EE 214.

PHYS 221A Quantum Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Examines the fundamental concepts of quantum mechanics including wave functions and the uncertainty relations. Also covers time dependence of quantum systems, such as the simple harmonic oscillator and simple two-level systems.

PHYS 221B Quantum Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 221A; graduate standing; consent of instructor. Covers angular momentum and approximation methods, including perturbation theory.

PHYS 221C Quantum Mechanics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 221B; graduate standing; consent of instructor. Covers symmetries in quantum mechanics, identical particles, and scattering theory.

PHYS 224 Frontiers of Physics and Astrophysics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Covers particle physics to cosmology from an experimental perspective. Includes the present status of our understanding of the physics of the universe, the major challenges, and future opportunities. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 225A Elementary Particles 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 221A, PHYS 221B, PHYS 221C; or consent of instructor. Provides an overview of particle physics. Topics include Quantum Electrodynamics (QED), the Quark-Parton Model, and Quantum Chromodynamics (QCD). Also discusses experimental techniques for particle detection and energy measurement. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 225B Elementary Particles 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 225A or consent of instructor. Covers advanced topics in particle physics such as the Standard model, Charge-Parity (CP) violation and conservation laws, and mixing in the neutral strange and bottom meson systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 226 Cosmology 4 Lecture, 3 hours; discussion, 1 hour., Prerequisite(s): graduate standing; PHYS 208. Discusses advanced topics in cosmology: Friedmann models and the large-scale structure of the universe, Hubble constant and deceleration parameter, and galaxy counting and the physics of the early universe. Also covers vacuum phase transitions, inflation, baryon number generation, fluctuations, topological defects and textures, primordial nucleosynthesis, density fluctuations, dark matter candidates, and the age of the universe. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 227 Particle Astrophysics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; PHYS 226. An introduction to current research in particle astrophysics: the very early universe, the origin of matter, primordial perturbations, the origin of structure, the nature of dark matter, vacuum energy, matter-antimatter asymmetry, neutrino astrophysics, gravitational radiation, black holes, the origin of ultrahigh energy cosmic rays, and Hawking radiation. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 229 Theory of Dark Matter Halos and Galaxies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. A theory-based study of the properties of dark matter halos and their connection to galaxy properties. Topics include dark matter collapse in the non-linear regime, Press-Schechter, self-similar collapse, acquisition of mass, and angular momentum. Includes the impact of dark matter properties on hosted galaxies, mergers, environmental effects, and scaling relations. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 230A Advanced Quantum Mechanics and Quantum Theory of Fields 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 221A, PHYS 221B, PHYS 221C; graduate standing; or consent of instructor. Topics include quantization of fields for particles with spins 0, 1/2, and 1; path integrals; Feynman diagrams; and scattering amplitude and cross sections. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 230B Advanced Quantum Mechanics and Quantum Theory of Fields 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 230A; graduate standing; or consent of instructor. Explores renormalization of quantum field theory, gauge invariance, spontaneous breaking of gauge symmetry, Quantum Chromodynamics, and electroweak interactions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 230C Advanced Quantum Mechanics and Quantum Theory of Fields 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): PHYS 230B; graduate standing; or consent of instructor. A study of current topics in quantum field theory, including solitons and instantons, supersymmetry, and the unification of all forces. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 231 Methods of Theoretical Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. A study of analytic functions, Cauchy's theorem, Taylor series, Laurent series expansions, the residue theorem, and analytic continuation.

PHYS 234 Physics of Nanoscale Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduction to fundamental quantum physics in nanoscale systems and low dimensional materials. Including synthesis of low-dimensional material systems; physics-based experimental approaches to nanotechnology; mesoscopic quantum transport of electrons; quantum phenomena involving spin; silicon nanoelectronics and beyond; and future electronics based on topological materials. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 234A.

PHYS 235 Spintronics and Nanoscale Magnetism 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Provides an overview of contemporary issues in nanoscale magnetism and spin-dependent phenomena in solids, including the fundamentals of magnetism, magnetism in reduced dimensions, novel magnetic materials, spin-polarized transport, spin coherence in semiconductors, magnetization dynamics, and device applications. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 234B.

PHYS 236 Experimental Techniques in Condensed Matter Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Survey of common experimental techniques used in the field of condensed matter physics. Topics include nanofabrication and characterization, advanced thin film growth methods, vacuum techniques, electrical and magnetic characterization, cryogenic instrumentation, optical measurements, X-ray techniques, data acquisition and analysis, and general lab techniques. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 237 Experimental Quantum Computing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Covers experimental approaches to quantum computing. Includes the basics of quantum computing and an introduction to physical realizations of a quantum computer. Focuses on ion traps and experimental implementation of quantum gates and quantum algorithms including search algorithms, quantum Fourier transform, and factorization. Also addresses quantum error correction codes. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 240A Condensed Matter Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 221C; graduate standing; or consent of instructor. Topics include classical and quantum theories of the electron gas; crystal and reciprocal lattices; crystal symmetries; electrons in a periodic potential; nearly free electrons; tight binding; band structure; metals, insulators and semiconductors; semiclassical dynamics; and semiclassical transport. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with MSE 214.

PHYS 240B Condensed Matter Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 240A; graduate standing; or consent of instructor. Topics include electron scattering, electron-electron interactions, classical and quantum harmonic crystals, and phonon dispersion relations. Also addresses dielectric properties, magnetism, and superconductivity. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 241A Advanced Statistical Physics and Field Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 212B; PHYS 221C; graduate standing; or consent of instructor. Topics include elementary excitations in many-body systems, critical phenomena and the renormalization group technique, Green's functions and Feynman diagrams, and other field-theory techniques, and advanced topics in condensed matter physics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 241B Advanced Statistical Physics and Field Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; PHYS 241A. Topics include advanced field-theory techniques applied to many-body systems, exactly soluble classical and quantum models in one and two dimensions, quantum Hall effect, and other advanced topics in condensed matter physics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 241C Advanced Statistical Physics and Field Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; PHYS 241B. Topics include quantum magnetism, unconventional superconductivity, localization, transport phenomena, mesoscopic systems, nonequilibrium phenomena, and advanced field-theory methods, such as methods for treating disorder. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 242 Physics at Surfaces and Interfaces 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Overview of surface science, electronic and geometric structure of clean surfaces, techniques for investigating structure, electron spectroscopy of surfaces, adsorption on surfaces, vibrations on surfaces, and epitaxial growth and applications of surface science. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 243 Foundations of Applied Machine Learning 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. For PHYS 243 online section; enrollment in the Online Master-in-Science in Engineering program. Covers basic principles of machine learning (ML) and introduces deep learning. Topics include ML algorithms, practical examples, and case studies for application of ML and deep learning to different disciplines. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 244 Application of Visualization in Data Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. For PHYS 244 online section; enrollment in the Online Master-in-Science in Engineering program. Develops interactive visualization and data mining techniques for massive multidimensional datasets. This includes 3D visualization and interaction, fast data exploration and development of big data solutions for text and binary data-intensive applications. Includes details of advanced data visualization techniques and the tools for handling and visualizing massive datasets.

PHYS 245 Atomic and Solid-State Physics With Positrons 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or the consent of instructor. An overview of the field of antimatter science. Includes beta decay, positron sources, positronium physics, positron annihilation spectroscopy, slow positron physics, solid state physics with slow positrons, atomic physics with slow positrons, and many positron physics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 246 Biological Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate or consent of instructor. Introduces topics at the interface of physics and biology: cell physiology, probability and information, diffusion, random walks, electrostatics, elasticity of biopolymers and membranes, DNA topology, friction in fluids, and low Reynolds numbers. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 247 Introduction to Applied Data Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 247 online section: enrollment in the Online-Master-in-Science in Engineering program. PHYS 247 in-person section: graduate standing; or consent of instructor. Designed to provide all the necessary background knowledge to follow other data science courses. Covers basic principles of machine learning (ML) and Python Programming and introduces deep learning. Topics include ML algorithms, practical examples, and case studies for application of ML and deep learning to different disciplines. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PHYS 250 Special Topics Seminar in Physics and Astronomy 2 Seminar, 2 hours. Prerequisite(s): graduate standing in Physics and Astronomy or consent of instructor. Includes oral presentations and intensive small-group discussion of selected topics in the area of specialization of each faculty member. Emphasizes recent advances in the special topic area; course content varies accordingly. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

PHYS 256 Advances in Nanoscale Physics 1 or 2 Seminar, 1 hour; individual study, 0 or 3 hours. Prerequisite(s): graduate standing. Seminars on current topics in nanoscale physics and materials science, including nanoelectronic devices, nanoelectromechanical systems, nanoscale biophysics, spintronics, nanoscale magnetism, nanophotonic systems, and advanced characterization techniques. Students who give class presentations receive credit for 2 units; other students receive credit for 1 unit. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PHYS 258 Seminar in Surface Science 1 Seminar, 1 hour. Prerequisite(s): graduate standing in Physics or Chemistry or consent of instructor. Oral presentations by participating visiting scholars, postdoctoral researchers, students, and UCR faculty on current research topics in surface science. Students who present a seminar or submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Cross-listed with CHEM 258.

PHYS 260 Special Topics in Condensed Matter Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Explores topics in condensed matter physics that emphasize recent advances. Content varies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 12 units.

PHYS 261 Special Topics in Astrophysics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Explores topics in astrophysics that emphasize recent advances. Content varies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 12 units.

PHYS 262 Special Topics in High Energy Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Explores topics in high energy physics that emphasize recent advances. Content varies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 12 units.

PHYS 288 Current Research Themes in Physics 2 Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Introduces first-year graduate students to current issues in physics research at UCR. Involves seminars by faculty on their research and interaction with advanced students and postdoctoral researchers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PHYS 289 Colloquium in Physics 1 Colloquium, 1 hour. Prerequisite(s): graduate standing; consent of instructor. Specialized discussions by visiting scientists, faculty, and students on current research topics in physics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PHYS 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor; consent of advisor or Department Chair. Individual study, directed by a faculty member, of specially selected topics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PHYS 291 Individual Study in Coordinated Areas 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Faculty-assisted programs of individual study for candidates who are preparing for examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable within the following limits: Up to 6 units may be taken prior to award of the Master's degree, such units to be in addition to minimum unit requirements for the degree. Up to 12 additional units may be taken (continued) prior to advancement to candidacy for the Ph.D.

PHYS 296 Summer Research in Physics 2 Research, 20 hours per quarter. Prerequisite(s): graduate standing; or consent of instructor. Provides mentoring by faculty on research and interaction with advanced graduate students and postdoctoral researchers. Graded Satisfactory (S) or No Credit (NC).

PHYS 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing; consent of instructor. Original research, in an area selected for the advanced degree, performed under the direction of a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PHYS 299 Research For Thesis Or Dissertation 1 to 12 Thesis, 3 to 36 hours. Prerequisite(s): graduate standing; consent of instructor. Original research, in an area selected for the advanced degree, performed under the direction of a faculty member. This research is to be included as a part of the dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

PHYS 301 Teaching of Physics at the College Level 2 Lecture, 2 hours. Prerequisite(s): graduate standing in Physics or consent of instructor. Required of all Teaching Assistants in the Department. Designed to introduce effective methods for teaching physics and to evaluate and improve teaching skills. Topics covered include lecture techniques, effective visual aids, improving laboratory and recitation section learning situations. Credit not applicable toward degree course requirements. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PHYS 302 Teaching Practicum 1 to 4 Consultation, 1 hour; laboratory, 3 to 12 hours; practicum, 3 to 12 hours. Prerequisite(s): Appointment as a departmental Teaching Assistant; graduate standing. Supervised teaching in Physics courses and regular consultation with faculty supervisor(s) regarding teaching responsibilities. Credit not applicable toward degree course requirements. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

PHYS 401 Professional Development in Physics and Astronomy 2 Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor; Introduces students to strategies for successful graduate study and early career development. Covers research and professional ethics, scientific writing (proposals, manuscripts, and abstracts), conference presentations, effective job search skills including preparation of curriculum vitae and networking, effective oral presentations, and job interviews. Visiting experts may give lectures on various topics. Graded Satisfactory (S) or No Credit (NC).

Plant Biology

See Botany and Plant Sciences

Microbiology and Plant Pathology

Subject abbreviation: PLPA
College of Natural and Agricultural Sciences

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Jason A. Rothman, Ph.D.

Affiliated Faculty

J. Ole Becker, Ph.D. (Nematology)
Isgouhi Kaloshian, Ph.D. (Nematology)
Kerry Mauck, Ph.D. (Entomology)
Philippe Rolshausen (BPSC)
Joel Sachs, Ph.D. (Biology)
Andreas Westphal, Ph.D. (Nematology).

Undergraduate Curriculum

The Department of Microbiology and Plant Pathology participates in the Microbiology and Botany and Plant Sciences majors leading to the baccalaureate degree. See the Microbiology or Botany and Plant Sciences section of this catalog.

Graduate Program

The Department of Microbiology and Plant Pathology offers the M.S. and Ph.D. degrees in Plant Pathology.

Admission

In addition to meeting the requirements for admission to the Graduate Division, students typically have a baccalaureate major in a biological science or training equivalent to that given in the Plant Science curriculum of the College of Natural and Agricultural Sciences. Majors in the physical sciences are welcomed, but students must be prepared to augment their undergraduate preparation with courses in the biological sciences.

All candidates for the M.S. or the Ph.D. degree should have good basic preparation in chemistry and biology. It is common for students to have completed courses in biochemistry, organic chemistry, cell and molecular biology, calculus, general physics, general botany, microbiology, statistics, genetics, plant physiology, mycology, and plant pathology. If these courses have been completed as an undergraduate, graduate study is facilitated. If students have not completed these courses prior to admission, they may be required to take them early in their graduate career.

Master's Degree

General university requirements are given in the Graduate Studies section of this catalog. The master's degree in Plant Pathology is offered under Plans I or II.

Plan I (Thesis) requires 36 units of upper-division and graduate courses, of which at least 24 must be in the 200 series courses in Plant Pathology or Nematology. A maximum of 12 units may be in graduate research for the thesis.

Plan II (Comprehensive Examination) requires 36 units of upper-division and graduate courses, of which at least 18 must be in the 200-series courses in Plant Pathology or Nematology, excluding graduate research for a thesis or dissertation, and a comprehensive final examination in the major subject.

The departmental graduate advisory committee, in consultation with the student's major professor or curriculum advisor, is responsible for prescribing the course of study, which requires as a minimum of PLPA 200, PLPA 206/NEM 206, PLPA 207, PLPA 210, PLPA 234, PLPA 250 and PLPA 265.

Doctoral Degree

In accord with the student's preparation and specific interests, the departmental graduate advisory committee, in consultation with the student's major professor or curriculum advisor, prescribes areas where study is required. In addition to selected subjects in plant pathology, related fields in which some degree of competence may be expected is drawn normally from biochemistry, biology, chemistry, cell and molecular biology, entomology, genetics, genomics, mathematics, microbiology, nematology, plant physiology, soils, and statistics.

The departmental graduate advisory committee, in consultation with the student's major professor or curriculum advisor, is responsible for prescribing the course of study.

Course Work
The course of study requires as a minimum PLPA 200, PLPA 206/NEM 206, PLPA 207, PLPA 210, PLPA 234, PLPA 250 and PLPA 265.

Written and Oral Qualifying Examinations
Students must demonstrate to the departmental graduate advisory committee, by written and oral examination, adequate preparation in the fields fundamental to plant pathology and in any area in which students have placed special emphasis in their training. A written dissertation research proposal is to be prepared before the qualifying examination and defended during the oral examination. After successful completion of the qualifying examination and all other formal requirements to the satisfaction of the dean of the Graduate Division, the student is advanced to candidacy for the Ph.D. degree.

The Oral Qualifying Exam can be taken in one of the following modes: In-Person or Hybrid. Remote participation by the student and the exam committee members is allowed under extenuating circumstances that include, but not limited to, health issues and personal or family emergencies. A student's remote participation must be communicated to the committee chair and the student in time to set up the remote option.

Dissertation and Final Oral Examination
A dissertation is required of every candidate. The dissertation must be approved by the dissertation committee before the candidate may take the final oral examination. The final oral examination deals primarily with defense of the dissertation and its relation to the field in which its subject lies.

The Final Defense can be taken in one of the following modes: In-Person or Hybrid. In-person participation is the norm, i.e., by default; therefore, no approval is needed. Remote participation by the student and the exam or thesis committee members is the exception, and it is allowed under extenuating circumstances that include, but not limited to, health issues and personal or family emergencies. A student's remote participation must be approved by a majority of the committee members. A faculty's remote participation must be communicated to the committee chair and the student in time to set up the remote option.

Professional Development Training
Both M.S. and Ph.D. students fulfill their professional development training by enrolling in PLPA 265, a 3-unit course that covers a range of topics including careers in plant pathology, cv preparation, skills on giving scientific presentations, strategies for success in the candidacy examination and graduate school. data acquisition, management and ownership, policy and regulation, as well as intellectual property.

Teaching Requirement
Ph.D. students must fulfill a one-quarter teaching requirement.

Normative Time to Degree 15 quarters

Lower-Division Courses

PLPA 010 Microbes and Society: A Window Into the Microbial World Around Us 4 Lecture, 3 hours; extra reading, 3 hours. An introduction to the remarkable diversity and biology of microorganisms. Emphasizes the areas microorganisms impact human affairs, including food production, agriculture, medicine, and history. Includes cheese-, yogurt-, wine-, beer- and bread-making; the Irish potato famine; tulipomania; antibiotics; mushrooms and mushroom lore; food preservation; microbial toxins and food poisoning; and vaccines and useful viruses.

Upper-Division Courses

PLPA 120 Introduction to Plant Pathology 3 Lecture, 3 hours. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 100H or BCH 110A, or BCH 110HA, may be taken concurrently; STAT 004; or equivalent. An introduction to the study of plant diseases. Topics include diseases and disease-causing agents, host-pathogen interaction during disease development, and strategies for disease management. An optional, separate laboratory is offered. Cross-listed with BIOL 120, and MCBL 120. Credit is awarded for one of the following PLPA 120, BIOL 120, MCBL 120, or PLPA 210.

PLPA 120L Introduction to Plant Pathology Laboratory 1 Laboratory, 4 hours. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; BIOL 120, may be taken concurrently or MCBL 120, may be taken concurrently or PLPA 120, may be taken concurrently; STAT 010, may be taken concurrently; BIOL 121/MCBL 121 and BIOL 124/MCBL 124 recommended; or consent of instructor. Covers fundamentals in the use of laboratory instruments and techniques for the detection, isolation, and identification of representative infectious agents that cause disease in plants. Cross-listed with BIOL 120L, and MCBL 120L. Credit is awarded for one of the following PLPA 120L, BIOL 120L, MCBL 120L, or PLPA 210.

PLPA 123 Introduction to Comparative Virology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 004, or equivalent; or consent of instructor. Considers viruses as infectious agents of bacteria, plants, and animals (vertebrates and invertebrates). Compares the major groups of viruses with respect to their biological and biochemical properties, molecular and genetic characteristics, and modes of replication. Cross-listed with BIOL 123, and MCBL 123.

PLPA 125 Pesticide Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 008B, BIOL 005C or CHEM 08HB; CHEM 08LB or CHEM 08HLB. An introduction to the chemistry, modes of action, and use of insecticides, rodenticides, herbicides, and biopesticides from discovery to environmental interactions. Includes genetics of pesticide resistance development, resistance management, government regulation, probit analysis, dilution and calculations of treatment rates, and sustainable pest management. Cross-listed with ENTM 125, and ENTX 125.

PLPA 134 Introduction to Mycology 3 Lecture, 3 hours. Prerequisite(s): BIOL 005C; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 004, or equivalent; or consent of instructor. Introduction to the morphology, taxonomy, genetics, physiology, ecology, and economic importance of the major groups of the fungi. Cross-listed with BIOL 134.

PLPA 134L Introduction to Mycology Laboratory 1 Laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, or equivalents; concurrent enrollment in BIOL 134/PLPA 134; or consent of instructor. Introduces fundamentals in the use of laboratory instruments and techniques for the isolation, cultivation, and identification of representatives of the major taxa of fungi. Cross-listed with BIOL134L.

PLPA 190 Special Studies 1 to 5
Prerequisite(s): consent of instructor. To be taken as a means of meeting special curricular problems.

PLPA 197 Research For Undergraduates 1 to 4 Prerequisite(s): consent of instructor. Individual research in plant pathology performed under the guidance of members of the staff.

Graduate Courses

PLPA 200 Fungal Diseases of Plants 3 Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): BIOL 134/PLPA 134 or consent of instructor. A study of important fungal diseases of plants including biology of development of pathogens, host-parasite relations, and survival strategies. Emphasizes disease physiology, epidemiology, etiology, and control measures including breeding for resistance and chemical and biological control.

PLPA 206 Phytopathogens: Nematodes 2 Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Recognition, diagnosis, biology, and control of major nematode diseases of plants. Laboratory covers identification techniques, soil sampling and processing techniques, and process of pathogenesis. Cross-listed with NEM 206.

PLPA 207 Bacterial and Viral Diseases of Plants 3 Lecture, 2 hours; laboratory, 3 hours. Prerequisite(s): BIOL 120, MCBL120, or PLPA 120; graduate standing; or consent of instructor. An extensive introduction to bacterial diseases of plants including symptomatology, epidemiology, diagnosis, control, and the physiology and biochemistry of plant-bacterial interactions.

PLPA 210 Introduction to Plant Pathology 5 Lecture, 3 hours; laboratory, 3 hours; discussion, 1 hour; term paper, 2 hour. Prerequisite(s): graduate standing. Studies

the major concepts and principles of plant pathology to become familiar with the group of pathogens causing infectious diseases in plants. Offers an understanding of the most recent approaches to study plant pathogens and the interactions with their host as they may be applied to animal and human research. Credit is not awarded for PLPA 210 if it has already been awarded for BIOL 120/BIOL 120L and/or PLPA 120/PLPA120L and/or MCBL 120/MCBL 120L.

PLPA 219 Molecular Plant Virology 3 Lecture, 3 hours. Prerequisite(s): PLPA 207. Molecular biology of plant, animal, and bacterial viruses and viroids. Emphasizes plant viruses, replication strategies, evolution, genetics, viruses as genetic vectors, and recombination.

PLPA 221 Chemical Control of Plant Diseases 3 Lecture, 3 hours. Prerequisite(s): graduate standing; consent of instructor. A study of the principles of selective toxicity as applied to the control of plant diseases; the chemistry and mechanism of action of antimicrobial agents.

PLPA 226 Microbial Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102; graduate standing. In-depth coverage of the genetics of microbes. Emphasizes the primary data and the foundation of modern techniques using viruses, archaea, prokaryotes, and eukaryotes. Includes genome sequences and organization, plasmids and other vectors, and mutation and genetic screens. Also covers transposable elements, recombination, and regulation of gene expression, development, and pathogenesis. Cross-listed with BIOL 221, and MCBL 221.

PLPA 230 Molecular Plant-Microbial Interactions 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BCH 100, BIOL 120 or MCBL 120 or PLPA 120, or equivalents; graduate standing. A study of the physiology of host-pathogen interactions with emphasis on the metabolism of diseased plants, nature of pathogenicity, and defense mechanisms in plants. Cross-listed with BPSC 230, CMDB 230, and GEN 230.

PLPA 234 Introduction to Mycology 5 Lecture, 3 hours; laboratory, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing in Plant Pathology. Introduction to the kingdom fungi and related kingdoms of organisms. Includes overview of major taxonomic groups of fungi and their morphology, physiology, classical genetics, and ecology. Discusses the economic importance of fungi as related to plant pathology. Credit is not awarded for PLPA 234 if it has already been awarded for BIOL 134/PLPA 134 and/or BIOL 134L/PLPA 134L.

PLPA 235 Epidemiology of Plant Disease 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 120/MCBL 120/PLPA 120. An introduction to the study of plant disease epidemics and their management. Topics will include: temporal, spatial, and genetic aspects of disease development in plant populations; assessment and prediction of disease and crop loss; inoculum density-disease relationships; and modeling.

PLPA 240 Field Plant Pathology 1 field trips, Prerequisite(s): graduate standing; consent of instructor. This course will deal with diagnosis of plant disease in the field, collection methods, identification of pathogens, and control methods. Graded Satisfactory (S) or No Credit (NC).

PLPA 241 Special Topics 2 Lecture, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Oral presentations and intensive small-group discussion of selected topics in each faculty member's area of specialization. Course content emphasizes recent advances in the special topic area and varies accordingly. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with MCBL 241.

PLPA 245 Field Mycology 1 field trips, Prerequisite(s): BIOL 134 or PLPA 134; graduate standing; or consent of instructor. This course will deal with observation, collection and identification of fungi both in the field and the laboratory. Graded Satisfactory (S) or No Credit (NC).

PLPA 246 Diagnosis of Plant Disease 2 Lecture, 3 hours; laboratory, 1 hour; field, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Field trips to observe symptomology of diseases in nature, identification by laboratory and greenhouse tests, approaches to control, culture practices for major California crops, and influences of crop management on disease development.

PLPA 250 Seminar in Plant Pathology 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Reports and discussions of selected topics in plant pathology by graduate students. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PLPA 261 Seminar in Genetics, Genomics, and Bioinformatics 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BIOL 261, BPSC 261, ENTM 261, and GEN 261.

PLPA 265 A Colloquium On the Principles of Plant Pathology 3 Lecture, 3 hours. Prerequisite(s): advanced standing in the program; graduate standing. Faculty members will rotate as leaders in structured discussions leading to a synthesis of concepts from other courses, the heterogeneity of plant pathology as a scientific discipline, and its unifying principles. Graded Satisfactory (S) or No Credit (NC).

PLPA 290 Research Or Study On Special Topics By Individual Graduate Students 1 to 6 Research, 1 to 6 hours. Prerequisite(s): graduate standing; and consent of instructor. This course is designed to allow graduate students to study an area or areas not covered by formal course work under a professor who will direct the amount and judge the quality of the work. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PLPA 291 Individual Study in Coordinated Areas 1 to 6 Research, 1 to 6 hours. Prerequisite(s): graduate status. A program of study designed to advise and assist candidates who are preparing for examinations. A student may take up to 12 additional units prior to successful completion of the Ph.D. qualifying examination. Graded Satisfactory (S) or No Credit (NC).

PLPA 297 Directed Research 1 to 6 Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PLPA 299 Research For Thesis Or Dissertation 1 to 12 Prerequisite(s): . . Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Political Science

Subject abbreviation: POSC
College of Humanities, Arts, and Social Sciences

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Joshua Wood, Ph.D.

Lecturers

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Jeremy Busacca, Ph.D.
Peter Mort, J.D.
W. Parkes Riley, Ph.D.

Majors

The Political Science Department offers undergraduate majors leading to B.A. degrees in Political Science, Political Science/Administrative Studies, Political Science/International Affairs, Political Science/Law and Society, and Political Science/Public Service. In addition, the department offers minors in Political Science and International Relations.

Counseling

Counseling on graduation and departmental requirements and on enrollment is handled in the department office by the student affairs staff.

For more information about the undergraduate programs, call or write the Department of Political Science, (951) 827-5502 or (951)827-5312.

Political Science Major

The study of political science provides undergraduates with career opportunities in law, government service, education, journalism, and business. Because career goals may vary, the department offers two distinct majors. For students planning careers in such areas as law, journalism, or teaching, the traditional major in Political Science is appropriate. For students considering careers in government service, especially for such positions as program and budget analyst, urban planner, and executive or administrative assistant, the appropriate major is the Political Science/Public Service major.

Further information on the study of law or the legal profession may be obtained from the departmental prelaw counselor.

Political Science/Administrative Studies Major

The Political Science/Administrative Studies major combines the disciplinary interests of political science with a particular focus on administrative behavior, tools of decision making, and politics of public policy. The Administrative Studies component provides an interdisciplinary approach to training in administrative analytical skills and, more importantly, to the study of the policies, politics, and theories of public administration. The Business Administration courses provide a variety of perspectives on these objectives. In addition, they should be of particular value to those planning to either enter directly into public administration (federal, state, or local levels) or attend a professional school of administration.

Political Science/International Affairs Major

The Political Science/International Affairs major offers a challenging opportunity to observe and participate in the dynamics of global interaction. As versatile as it is valuable, a degree in international affairs prepares the student for work in many diverse careers in the private sector, government, and academia. From diplomatic missions to the United Nations to intense debate with a private "think tank," careers in international affairs should appeal to students seeking to understand and influence the world in which we live.

Political Science/Law and Society Major

The Law and Society major is open to undergraduate students with junior standing who have completed LWSO 100 with a grade of "C" or higher. The major combines the breadth of a political science major with a particular focus on the theme of law and law-like relationships. The major provides a multidisciplinary approach to the study of legal and law-like institutions and relationships and focuses on relationships that have formed the core of political science: the emergence and development of law, the relationship between law and values, and the growth of the power of the state, among others. The courses provide a variety of perspectives on this theme, and the range of courses should be of particular benefit to those who plan to attend law school.

Political Science/Public Service Major

The Political Science/Public Service major introduces students to knowledge and skills associated with managerial career positions in government, without sacrifice of either a broad knowledge of politics or a liberal arts education.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The Political Science Department offers undergraduate majors leading to B.A. degrees in Political Science, Political Science/Administrative Studies, Political Science/International Affairs, Political Science/Law and Society, and Political Science/Public Service.

Political Science Major

The major requirements for the B.A. degree in Political Science are as follows:

1. **Lower-division requirements (four courses [at least 16-20 units]): one course from a, b, c, and d.**

   Students in the major must complete two of the four lower-division Political Science courses with a grade of "C" or better in order to take upper-division Political Science courses.

   a) POSC 005 or POSC 005H or POSC 005W or POSC 007 or POSC 007W

   b) POSC 010 or POSC 010H or POSC 010W

   c) POSC 015 or POSC 015H or POSC 017

   d) POSC 020 or POSC 020H

Upper-division requirements (nine courses [at least 36 units])

a) One course from each of the following areas:

(1) **U.S. Government and Politics:** POSC 100, POSC 101, POSC 104 or 104S, POSC 108, POSC 143 or POSC 143S, POSC 144 or POSC 144S, POSC 145, POSC 146, POSC 148 or POSC 148H or POSC 148S, POSC 149, POSC 166, POSC 167, POSC 168, POSC 170, POSC 171, POSC 173 or POSC 173S, POSC 180 or POSC 180S, POSC 181, POSC 182E, POSC 183E, POSC 184 or POSC 184S, POSC 186

(2) **Comparative Government and Politics:** POSC 102 or POSC 102S, POSC 109/RLST 173 POSC 120, POSC 151 or POSC 151S, POSC 152, POSC 153, POSC 154, POSC 155 or POSC 155S, POSC 156, POSC 157 or POSC 157S, POSC 158/LNST 148, POSC 159 or POSC 159S, POSC 160E or POSC 160F, POSC 161/LNST 188, POSC 162/LNST142 or POSC 162S/LNST 142S, POSC 163 or POSC 163S, POSC 164 or POSC 164S, POSC 165 or POSC 165S, POSC 178 or POSC 178S, POSC 188 or POSC 188S

(3) **International Relations and Foreign Policy:** POSC 123, POSC 124 or POSC 124S, POSC 125, POSC 126 or POSC 126S, POSC 127/SEHE 127 or POSC 127S/SEHE 127S, POSC128, POSC 129, POSC 130, POSC 132 or POSC 132S, POSC 134 or POSC 134S, POSC 135, POSC 136 or POSC 136S POSC 137/SEHE 137 or POSC 137S/SEHE 137S, POSC 138 or POSC 138S, POSC 139 or POSC 139S, POSC 147 or POSC 147S, POSC 150 or POSC 150S, POSC 169, POSC 182F or POSC 182G, POSC 183F or POSC 183G

(4) **Political Theory:** POSC 106/SEHE 136 or POSC 106S/SEHE 136S, POSC 110 or POSC 110S, POSC 111 or POSC 111S, POSC 112 or POSC 112S, POSC 113, POSC 115 or POSC 115S, POSC 116 or POSC 116S, POSC 117 or POSC 117S, POSC 119, POSC121/CLA 121/CPAC 121 or POSC 121S /CLA 121S/CPAC 121S, POSC 122 or POSC 122S

b) Five additional courses in Political Science course work (Not more than 2 courses from the 190 series and POSC 142L and POSC 142M are allowed toward the nine-course upper-division requirement.)

A course in statistics is strongly recommended.

Political Science/Administrative Studies Major

The major requirements for the B.A. degree in Political Science/Administrative Studies are as follows. Note that the prerequisite for POSC 198-I is a GPA of 2.70 or better.

Political Science requirements (48 units)

1. Lower-division requirements

   Three courses from POSC 005 or POSC 005H or POSC 005W or POSC 007 or POSC 007W; POSC 010 or POSC 010H or POSC 010W; POSC 015 or POSC 015H or POSC 017; POSC 020 or POSC 020H

   Students in the major must complete two of the three lower-division Political Sci-

ence courses with a grade of "C" or better in order to take upper- division political science courses.

2. Upper-division requirements

a) Three courses from POSC 181, POSC 182E or POSC 182F or POSC 182G, POSC 183E or POSC 183F, POSC186

b) At least one course from each of the following:

(1) **U.S. Government and Politics:** POSC 100, POSC 101, POSC 104 or POSC 104S, POSC 108, POSC 143 or POSC 143S, POSC 144 or POSC 144S, POSC 145, POSC 146, POSC 148 or POSC 148H or POSC 148S, POSC 149, POSC 166, POSC 167, POSC 168, POSC 170, POSC 171, POSC 173 or POSC 173S, POSC 180 or POSC 180S, POSC 181, POSC 182E, POSC 183E, POSC 184 or POSC 184S, POSC 186

(2) **Comparative Government and Politics:** POSC 102 or POSC 102S, POSC 109/RLST 173, POSC 120, POSC 151 or POSC 151S, POSC 152, POSC 153, POSC 154, POSC 155 or POSC 155S, POSC 156, POSC 157 or POSC 157S, POSC 158/LNST 148, POSC 159 or POSC 159S, POSC 160 or POSC 160S, POSC 161/LNST 188, POSC 162/LNST 142 or POSC 162S/LNST 142S, POSC 163 or POSC 163S, POSC 164 or POSC 164S, POSC 165 or POSC 165S, POSC 178 or POSC 178S, POSC 188 or POSC 188S

(3) **International Relations and Foreign Policy:** POSC 123, POSC 124 or POSC 124S, POSC 125, POSC 126 or POSC 126S, POSC 127/SEHE 127 or POSC 127S/SEHE 127S, POSC 128, POSC 129, POSC 130, POSC 132 or POSC 132S, POSC 134 or POSC 134S, POSC 135, POSC 136 or POSC 136S, POSC 137/SEHE 137 or POSC 137S/SEHE 137S, POSC 138 or POSC 138S, POSC 147 or POSC 147S, POSC 150 or POSC 150S, POSC 153, POSC 169, POSC 182F or POSC 182G, POSC 183F

(4) **Political Theory:** POSC 106/SEHE 136 or POSC 106S/SEHE 136S, POSC 107, POSC 110 or POSC 110S, POSC 111 or POSC 111S, POSC 112 or POSC 112S, POSC 113, POSC 115 or POSC 115S, POSC 116 or POSC 116S, POSC 117 or POSC 117S, POSC 119, CLA 121/CPAC 121/POSC 121 or CLA 121S/CPAC 121S/POSC 121S, POSC 122 or POSC 122S

c) Four (4) units from POSC 198G or POSC 198-I (prerequisite: GPA of 2.70 or better)

d) Additional four (4) units in any upper-division Political Science course

Administrative Studies requirements (37 units)

1. Lower-division courses (17 units)

a) BUS 010, BUS 020

b) STAT 008 or equivalent (may be used to satisfy breadth requirements)

c) CS 008 (may be used to satisfy breadth requirements)

2. Upper-division requirements (20 units)

a) Two courses (8 units) from the list below: (1) ECON 102 or ECON 103 or ECON 104A or ECON130 or ECON 162/BUS 162

(2) PSYC 140 or PSYC 142

(3) SOC 150 or SOC 151

(4) POSC 181 or POSC 182E or POSC 182G or POSC 183 or POSC 186

(5) ANTH 127 or ANTH 127S or ANTH 131

These two courses must be outside the discipline of Political Science and cannot be courses included as part of the three course Business Administration track or their cross-listed equivalents.

b) A three-course track (12 units) in Business Administration courses from one of the following:

(1) **Organizations (General):** BUS 100W, BUS 107, BUS 158/ANTH 105, BUS 176/SOC 176, SOC 150, SOC 151

(2) **Human Resources Management/ Labor Relations:** BUS 100W, BUS 107, BUS 121, BUS 144, BUS 145, BUS 153/ECON 153, BUS 155, BUS 156, BUS 157, PSYC 142

(3) **Business and Society:** BUS 100W, BUS 102, BUS 107, PHIL 116, POSC 182E or POSC 182G, POSC 186

(4) **Marketing:** BUS 103, and two from BUS 111, BUS 112, BUS 113, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119, BUS 124, BUS 126, BUS 151, BUS 152, BUS 159, BUS 164, BUS 182

(5) **Managerial Accounting/Taxation:** BUS 108, and two from BUS 166, BUS 168A, BUS 168B

(6) **Financial Accounting:** BUS 108, BUS 165A, BUS 165B, BUS 165C, BUS 167

(7) **Finance:** BUS 106/ECON 134 and two from BUS 131, BUS 132, BUS 134, BUS 135, BUS 136, BUS 137, BUS 138, BUS 139 BUS 140E, BUS 141, BUS 147

(8) **Management Information Systems:** BUS 101, BUS 110, BUS 125, BUS 128, BUS 171, BUS 172, BUS 173, BUS 174, BUS 175, BUS 179

(9) **Production Management:** BUS 104/STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

Note: In filling the dual requirements of the selected major, students may not count more than two courses toward both parts of their total requirements (Political Science requirements and Administrative Studies requirements).

Political Science/International Affairs Major

The major requirements for the B.A. degree in Political Science/International Affairs are as follows:

1. Lower-division requirements (two courses [at least 8-10 units]): One course from a and one course from b:

a) POSC 015 or POSC 015H or POSC 017

b) POSC 020 or POSC 020H

Students in the major must complete two lower- division Political Science courses with a grade of "C" or better in order to take upper-division political science courses.

Upper-division requirements (11 courses, 44-55 units):

a) International Relations and Foreign Policy (three courses): POSC 123, POSC 124 or POSC 124S, POSC 125, POSC 126 or POSC 126S, POSC 127/SEHE 127 or POSC 127S/SEHE 127S, POSC 128, POSC 129, POSC 130, POSC 132 or POSC 132S, POSC 134 or POSC 134S, POSC 135, POSC 136 or POSC 136S, POSC 137/SEHE 137 or POSC 137S/SEHE 137S, POSC 138 or POSC 138S, POSC 139 or POSC 139S, POSC 147 or POSC 147S, POSC 150 or POSC 150S, POSC 169, POSC 182F or POSC 182G, POSC 183F

b) Comparative Government and Politics (three courses): POSC 102 or POSC 102S, POSC 109/RLST 173, POSC 120, POSC 151 or POSC 151S, POSC 152, POSC 153, POSC 154, POSC 155 or POSC 155S, POSC 156, POSC 157 or POSC 157S, POSC 158/LNST 148, POSC 159 or POSC 159S, POSC 160 or POSC 160S, POSC 161/LNST 188, POSC 162/LNST 142 or POSC 162S/LNST 142S, POSC 163 or POSC 163S, POSC 164 or POSC 164S, POSC 165 or POSC 165S, POSC 178 or POSC 178S, POSC 188 or POSC 188S

c) General Political Science (three other political science courses in any subfield).

d) In addition, students must take two courses from the following:

ANTH109/GSST 109, ANTH 122, ANTH 127 or ANTH 127S, ANTH 136/SEAS 136, ANTH 139, ANTH 161/LNST 161, ANTH 163, ANTH 164/LNST 164/GSST 164, ANTH168/ETST148/LNST168, ANTH 169/GBST 169, ANTH 182, ANTH 186/LNST 166, ANTH 188/GSST 151 ECON 171, ECON 175, ECON 178/ BUS 178, ECON 181, ECON 182, ECON 185/LNST 185 HISA 117A, HISA 117B, HISA 140, HISA 161, HISA 162, HISA 163B, HISA 164A, HISA 164B, HISA 165, HISA 166, HISE 141, HISE 142, HISE 145 or HISE 145S, HISE 146 or HISE 146S, HISE 147, HISE 152, HISE 162, HISE 174, HIST 124, HIST 125, HIST 127, HIST 182, HIST 184, HIST 186, SOC 135, SOC 137, SOC 161, SOC 181

Students may petition for permission to count a specific course not on this list.

Political Science/International Affairs majors are strongly encouraged to learn a language other than English. The university offers language instruction in Chinese, French, German, Greek, Italian, Japanese, Korean, Latin, Portuguese, Spanish, and Vietnamese.

Political Science/Law and Society Major

The major requirements for the B.A. degree in Political Science/Law and Society are as follows:

1. **Political Science requirements (60 units)**

All major requirements for the B.A. in Political Science

2. **Law and Society requirements (36 units)**
   a) PHIL 007 or PHIL 007H
   b) LWSO 100 (with a grade of "C" or better)
   c) One course chosen from POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
   d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159
   e) Two courses chosen from HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180
   f) LWSO 193, Senior Seminar

Note: For sections 2.d) and 2.e) combined, not more than two courses may be taken from the same department in filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (Political Science requirements and Law and Society requirements).

Political Science/Public Service Major

The major requirements for the B.A. degree in Political Science/Public Service are as follows. Note that the prerequisite for POSC 198-I is a GPA of 2.70 or better.

1. **Lower-division requirements (five courses [at least 20-25 units])**
   a) POSC 010 or POSC 010H or POSC 010W
   b) One course from POSC 005 or POSC 005H or POSC 005W, POSC 007 or POSC 007W, POSC 015 or POSC 015H or POSC 017, POSC 020 or POSC 020H
   c) ECON 003
   d) SOC 004
   e) SOC 005 or STAT 040

Students in the major must complete two of the lower-division Political Science courses with a grade of "C" or better in order to take upper-division political science courses.

2. **Upper-division requirements (11 courses [at least 40-48 units])**
   a) Political Science distribution: choose one course from each group
      (1) **Comparative Government and Politics Group:** POSC 102 or POSC 102S, POSC 109/RLST 173, POSC 120, POSC 151 or POSC 151S, POSC 152, POSC 153, POSC 154, POSC 155 or POSC 155S, POSC 156, POSC 157 or POSC 157S, POSC 158/LNST 148, POSC 159 or POSC 159S, POSC 160 or POSC 160S, POSC 161/LNST 188, POSC 162/ LNST 142 or POSC 162S/LNST 142S, POSC 163 or POSC 163S, POSC 164 or POSC 164S, POSC 165 or POSC 165S, POSC 178 or POSC 178S, POSC 188 or POSC 188S
      (2) **International Relations and Foreign Policy Group:** POSC 123, POSC 124 or POSC 124S, POSC 125, POSC 126 or POSC 126S, POSC 127/SEHE 127 or POSC 127S/SEHE 127S, POSC 128, POSC 129, POSC 130, POSC 132 or POSC 132S, POSC 134 or POSC 134S, POSC 135, POSC 136 or POSC 136S, POSC 137/SEHE 137 or POSC 137S/SEHE 137S, POSC 138 or POSC 138S, POSC 139 or POSC 139S, POSC 147 or POSC 147S, POSC 150 or POSC 150S, POSC 169, POSC 182F or POSC 182G, POSC 183F
      (3) **Political Theory Group:** POSC 106/SEHE 136 or POSC 106S/SEHE 136S, POSC 110 or POSC 110S, POSC 111 or POSC 111S, POSC 112 or POSC 112S, POSC 113, POSC 115 or POSC 115S, POSC 116 or POSC 116S, POSC 117 or POSC 117S, POSC 119, POSC 121/CLA 121/CPAC 121 or POSC 121S/CLA 121S/CPAC 121S, POSC 122 or POSC 122S
   b) Public Service requirement
      (1) a) Choose one: POSC 181 or POSC 182E; b) Choose one: POSC 183E or POSC 183F
      (2) Eight (8) units from POSC 198G and POSC 198-I (prerequisite: GPA of 2.70 or better)
      (3) An additional four courses from POSC 100, POSC 101, POSC 104 or POSC 104S, POSC 108, POSC 143 or POSC 143S, POSC 144 or POSC 144S, POSC 145, POSC 146, POSC 148 or POSC 148H or POSC 148S, POSC 149, POSC 166, POSC 167, POSC 168, POSC 170, POSC 171, POSC 173 or POSC 173S, POSC 180 or POSC 180S, POSC 181, POSC 182E, POSC 183E, POSC 184 or POSC 184S, POSC 186

Minor

The Political Science Department offers a minor in Political Science.

1. **One lower-division course (at least 5 units) in political science**, selected from POSC 005 or POSC 005H or POSC 005W or POSC 007 or POSC 007W; POSC 010 or POSC 010H or POSC 010W; POSC 015 or POSC 015H or POSC 017; POSC 020 or POSC 020H
2. **Five upper-division courses (at least 20 units) to be selected as follows:**
   a) One course in each of the following areas (4 courses):
      (1) **American Politics:** POSC 100, POSC 101, POSC 104 or POSC 104S, POSC 108, POSC 143 or POSC 143S, POSC 144 or POSC 144S, POSC 145, POSC 146, POSC 148 or POSC 148H or POSC 148S, POSC 149, POSC 166, POSC 167, POSC 168, POSC 170, POSC 171, POSC 173 or POSC 173S, POSC 180 or POSC 180S, POSC 181, POSC 182E, POSC 183E, POSC 184 or POSC 184S, POSC 186
      (2) **Comparative Politics:** POSC 102, POSC 102S, POSC 109/RLST 173, POSC 120, POSC 151 or POSC 151S, POSC 152, POSC 153, POSC 154, POSC 155 or POSC 155S, POSC156, POSC 157 or POSC 157S, POSC 158/LNST 148, POSC 159 or POSC 159S, POSC 160 or POSC 160S, POSC 161/LNST 188, POSC 162/LNST 142 or POSC 162S/LNST 142S, POSC 163 or POSC 163S, POSC 164 or POSC 164S, POSC 165 or POSC 165S, POSC 178 or POSC 178S, POSC 188 or POSC 188S
      (3) **International Relations:** POSC 123, POSC 124 or POSC 124S, POSC 125, POSC 126 or POSC 126S, POSC 127/SEHE 127 or POSC 127S/SEHE 127S, POSC 128, POSC 129, POSC 130, POSC 132 or POSC 132S, POSC 134 or POSC 134S, POSC 135, POSC 136 or POSC 136S, POSC 137/SEHE 137 or POSC 137S/SEHE 137S, POSC 138 or POSC 138S, POSC 139 or POSC 139S, POSC 147 or POSC 147S, POSC 150 or POSC 150S, POSC 169, POSC 182F or POSC 182G, POSC 183F
      (4) **Political Theory:** POSC 106/SEHE 136 or POSC 106S/SEHE 136S or POSC 107, POSC 110 or POSC 110S, POSC 111 or POSC 111S, POSC 112 or POSC 112S, POSC 113, POSC 115 or POSC 115S, POSC 116 or POSC 116S, POSC 117 or POSC 117S, POSC 119, POSC 121/CLA 121/CPAC 121 or POSC 121S/CLA 121S/CPAC 121S, POSC 122 or POSC 122S
   b) One additional course selected by the student from among those listed in (1) through (4) above.

The Political Science Department also offers a minor in **International Relations** (listed elsewhere in this catalog). Also, see Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Honors Program

The Political Science undergraduate Honors Program is designed to provide qualified upper-division Political Science majors with opportunities to engage in upper-division course work in the field in an intensive seminar format and to obtain the necessary training to engage in independent research in the field.

Upon successful completion of the program, students are awarded and have posted on their transcripts, the designation Honors, Department of Political Science Undergraduate Honors Program.

Complete details and an application are available from the Political Science Student Affairs Officer.

Prerequisites for the Honors Program

1. Submission of an application during the last quarter of the sophomore or junior year
2. Junior standing (completion of a minimum of 86 units)
3. Minimum GPA requirements or consent of director
   a) Cumulative GPA of 3.50
   b) A GPA of 3.50 in upper-division major courses
4. Statistics or methods course required. One course chosen from POSC 114 or POSC 114S, PSYC 012, SOC 004 (or an equivalent course in research methods)

Requirements for the Honors Program

Twelve (12) units/three courses from the following:

POSC 175H (Introduction to the Honors Thesis)

POSC 176H (Seminar on Writing

the Honors Thesis)

POSC 177H (Honors Thesis)

POSC 199 (Senior Research [Thesis Optional])

Model United Nations (MUN)

The Model United Nations (MUN) program is a campuswide activity that combines academic and social aspects. The academic preparation takes place within the Political Science Department, with one course, POSC 142L. The simulation preparation takes place within the UCRMUN organization, for participation in external conferences. Each year, the UCRMUN organization hosts a two-day MUN conference, which attracts over a thousand high school students. In recent years, the UCRMUN High School MUN has been the third largest in the nation. Planning and running this conference is entirely in the hands of UCR students participating in the UCRMUN program. The program provides training in administration and diplomacy. In the spring, a UCRMUN delegation attends either a local conference or the National Model United Nations Conference in New York City.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Graduate Program

The Department of Political Science offers the M.A. and Ph.D. degrees in Political Science.

Admission

Admission to both the M.A. and Ph.D. degrees is based on the quality and character of previous academic work and letters of evaluation from previous instructors. Applications are accepted for the Fall quarter only.

Master's Degree

The Department of Political Science offers the M.A. degree in Political Science.

Usually, the department operates under Plan II.

Plan II (Comprehensive Examination)

Students must complete 36 units, of which at least 32 units must be in 200-level Political Science courses, including POSC 201, POSC 202A, and POSC 203. In addition, students must complete at least one course from at least three of the five fields offered by the department (see listing below). Up to 4 units of academic work in related fields may be approved by the graduate advisor as part of the 36 units.

The examination must be passed in one of the following fields:

1. **Comparative Politics**
   Students must complete at least two courses in the field chosen from POSC 217, POSC 227, POSC 257, POSC 263, POSC 266, POSC 271, POSC 272, POSC 273, POSC 274, POSC 275, POSC 276, POSC 277, POSC 278, POSC 279, and POSC 282.
2. **International Relations**
   Students must complete the core course POSC 216 and at least one additional course in the field chosen from POSC 214, POSC 215, POSC 218, POSC 262, POSC 263, POSC 264, POSC 267, POSC 268, and POSC 269.
3. **American Politics**
   Students must complete the core course POSC 249 and at least one additional course in the field chosen from POSC 208, POSC 220, POSC 250, POSC 252, POSC 254, POSC 259, and POSC 261.
4. **Mass Political Behavior**
   Students must complete a core course, either POSC 255 or POSC 256, and at least one additional course in the field chosen from POSC 208, POSC 220, POSC 253, POSC 257, POSC 258, POSC 259, POSC 260, and POSC 277.
5. **Political Theory**
   Students must complete the core course POSC 212 and at least one additional course in the field chosen from POSC 213, POSC 267, POSC 268, POSC 280, POSC 281, and POSC 283.

Permission to complete the M.A. program under Plan I (Thesis) is restricted to students who can demonstrate a readiness to undertake advanced independent research and who can identify a faculty member willing to supervise preparation of the thesis.

Doctoral Degree

The Department of Political Science offers the Ph.D. degree in Political Science.

The first two years of the program are devoted to course work and preparation for the Ph.D. examination. During this period, students obtain substantive background in the discipline through completion of three graduate courses per quarter. Course work, which will usually continue beyond the second year, includes the following required components:

1. Selecting two major fields of concentration from the five fields listed below.
2. Satisfying course requirements for the major fields, which requires a total of eight graduate courses. (This is the **Major Field Requirement**; see details below.)
3. Taking one course in each of the three fields of study not selected by the student as a major field. (This is the **Distribution Requirement**.)
4. Taking three additional graduate courses in any field of study, according to the student's choice, in consultation with the faculty advisors. With permission of the Graduate Advisor, one or more of these courses may be graduate-level courses outside of Political Science. (This is the **Depth Requirement**.)
5. Students must complete POSC 201, 202A and 203 and at least two additional graduate courses in methods. The two additional courses may include POSC 202B, 204, 205, 207, 225, or other graduate methods courses. One of these may be from outside the Political Science Department, by permission of the Graduate Advisor. (This is the Methods Requirement.)
6. Enrollment in POSC 230. Students must be enrolled in the course during their first year in the program, and subsequently during quarters of their choice, until completion of 10 units, to be completed by the end of their fifth year. Exceptions only by permission of Graduate Advisor. (This is the **Professional Development** Requirement.)

The major fields may be chosen from among American Politics, Mass Political Behavior, Comparative Politics, International Relations, and Political Theory.

1. **Comparative Politics**
   Students must complete at least four courses in the field chosen from POSC 217, POSC 227, POSC 257, POSC 263, POSC 266, POSC 271, POSC 272, POSC 273, POSC 274, POSC 275, POSC 276, POSC 277, POSC 278, POSC 279, and POSC 282.
2. **International Relations**
   Students must complete the core course POSC 216 and at least three additional courses in the field chosen from POSC 214, POSC 215, POSC 218, POSC 262, POSC 263, POSC 264, POSC 267, POSC 268 and POSC 269.
3. **American Politics**
   Students must complete the core course POSC 249 and at least three additional courses in the field chosen from POSC 208, POSC 220, POSC 250, POSC 252, POSC 254, POSC 259, POSC 260 and POSC 277.
4. **Mass Political Behavior**
   Students must complete a core course, either POSC 255 or POSC 256, and at least three additional courses in the field chosen from POSC 208, POSC 220, POSC 253, POSC 257, POSC 258, POSC 259, POSC 260 and POSC 277.
5. **Political Theory**
   Students must complete the core course POSC 212 and at least three additional courses in the field chosen from POSC 213, POSC 267, POSC 268, POSC 280, POSC 281, and POSC 283.

One POSC 290 course may be accepted in lieu of a seminar. This limit may be exceeded by permission of Graduate Advisor if course staffing or scheduling problems require it. All POSC 290 courses must have prior approval of the graduate advisor. A POSC 290 course should only be taken if the material to be covered is not available in a scheduled course.

Written Qualifying Examination

Students should ordinarily complete major field course requirements during Years One and Two. In the fall quarter of Year Three, the student continues to enroll in POSC 230, while also enrolling in POSC 291 (Individual Coordinated Study), which is designed to aid preparation for the comprehensive examination. Written examinations in the two major fields are normally taken in the two weeks before the start of the fall quarter of the third year. Postponements to this schedule are allowed in exceptional circumstances; all delays in taking comprehensive examinations must be approved by the Graduate Committee.

Oral Defense of Prospectus
The winter and spring quarters of Year Three and all of Year Four are devoted to Directed Research (POSC 297) to prepare a dissertation prospectus under the direction of the principal advisor; to additional substantive seminars; and to continued participation in POSC 230. The choice of substantive seminars during this time should be made in conjunction with faculty advisors and should usually be applicable either to the distribution or depth requirements, although students may also take courses in excess of these requirements. No later than the fall quarter of Year 5, students are advanced to candidacy upon successful completion of the oral defense of their dissertation prospectus. Oral exams (or prospectus defense) should be completed no later than quarter 13 or fall of year 5.

The Oral Defense of Prospectus (Oral Qualifying Exam) can be taken in any of the following modes: **In-Person**, **Remote**, or **Hybrid**. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. Students completing the defense In-person are expected to present on campus with all committee members physically present. If Remote is chosen, all committee members and student have the option to attend remotely. If Hybrid is chosen, the student is expected to present the exam on campus in a video enabled room that supports some members physically present and others remote. At least one member of the committee must be physically present for a Hybrid exam.

Normative time to completion of the program is six years. Additional time is provided if circumstances warrant it. Whether circumstances justify additional time is to be determined by the Graduate Committee, in cooperation with the thesis advisor.

Students who do not complete their degree requirements during this two-year period are closely reviewed on a biannual basis. These reviews are provided by the graduate advisor, after consultation with the dissertation advisor. Until completion of the Ph.D. requirements, each review includes targeted amounts of required progress, to be completed prior to the next review. Students who fail to complete their scheduled work are reviewed by the Graduate Program Committee for a recommendation of termination from the Political Science graduate program.

Dissertation and Final Defense

Students must complete a dissertation on a subject chosen by the candidate, bearing on the principal field area and showing the student's ability in independent investigation. The dissertation committee guides the student in preparing the dissertation. Students are required to complete a final oral examination to defend the dissertation unless waived by the dissertation committee chair and the graduate advisor.

The Final Defense (Final Oral Examination) may be taken in any of the following modes: In-Person, Remote, or Hybrid. The student and their advisor will discuss which mode beset suits the subject matter, with the advisor making the final determination. Students completing the defense In-person are expected to present on campus with all committee members physically present. If Remote is chosen, all committee members and the student have the option to attend remotely. If Hybrid is chosen, the student is expected to present the exam on campus in a video enabled room that supports some members physically present and others remote. At least one member of the committee must be physically present for a Hybrid exam.

Normative Time to Degree 18 quarters.

General regulations applying to the dissertation and qualifying examinations are found in the Graduate Studies section of this catalog and in other Graduate Division and department publications.

For further information, contact the graduate advisor, Department of Political Science.

Lower-Division Courses

POSC 005 Political Ideologies 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An introductory study of the ideologies of the modern era. Explores selected thinkers and texts representative of liberalism, conservatism, socialism, fascism, nationalism, nonviolence, and feminism, as well as various non-Western ideologies. Credit is awarded for only one of POSC 005, POSC 005H, or POSC 005W.

POSC 005H Honors Political Ideologies 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to POSC 005 and POSC 005W. An introductory study of the ideologies of the modern era. Explores selected thinkers and texts representative of liberalism, conservatism, socialism, fascism, nationalism, nonviolence, and feminism, as well as various non-Western ideologies. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of POSC 005, POSC 005H, or POSC 005W.

POSC 005W Political Ideologies 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 040G; WRIT 020 with a grade of C or better, WRIT 020S with a grade of C or better; or consent of instructor. An introductory study of the ideologies of the modern era. Explores selected thinkers and texts representative of liberalism, conservatism, socialism, fascism, nationalism, nonviolence, and feminism as well as various non-Western ideologies. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to WRIT 030. Credit is awarded for one of the following POSC 005W, POSC 005, or POSC 005H. Credit is awarded for one of the following POSC 005W, POSC 005, or POSC 005H.

POSC 007 Introduction to Political Theory 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An introductory exploration of political theory from the ancient world to the present. Covers either Western theorists (from Aristotle to Rawls) or non-Western theorists (from Confucius to Gandhi). Topics include citizenship, community, political change, and human flourishing. Credit is awarded for one of the following POSC 007 or POSC 007W.

POSC 007W Introduction to Political Theory 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 040I; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; or consent of instructor. An introductory exploration of political theory from the ancient world to the present. Covers either Western theorists (from Aristotle to Rawls) or non-Western theorists (from Confucius to Gandhi). Topics include citizenship, community, political change, and human flourishing. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to WRIT 030. Credit is awarded for one of the following POSC 007W or POSC 007.

POSC 010 American Politics 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An introduction to the principles and practices of government. Focuses on the policy process and selected political issues in the United States. Credit is awarded for one of the following POSC 010, POSC 010H, or POSC 010W.

POSC 010H Honors American Politics 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to POSC 010. An introduction to the principles and practices of government. Focuses on the policy process and selected political issues in the United States. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of POSC 010 or POSC 010H or POSC 010W.

POSC 010W American Politics 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 040J; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; or consent of instructor. An introduction to the principles and practices of government. Focuses on the policy process and selected political issues in the United States. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to WRIT 030. Credit is awarded for one of the following POSC 010W, POSC 010, or POSC 010H.

POSC 015 Comparative Politics 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. A comparative analysis of contemporary political systems, practices, and institutions. Credit is awarded for one of the following POSC 015 or POSC 015H.

POSC 015H Honors Comparative Politics 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to University Honors or consent

of instructor. Honors course corresponding to POSC 015. A comparative analysis of contemporary political systems, practices, and institutions. Credit is awarded for only one of POSC 015 or POSC 015H.

POSC 017 Politics of the Global South 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. An introduction to the political processes and problems confronting states in the Global South. Topics include political and economic development issues such as poverty, violence, dictatorship, regime types, regime transitions, corruption, and patronage.

POSC 020 World Politics 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Explores approaches to and models of international relations. Includes theories, the causes of war, international organizations, cooperation and conflict, international political economy, regional economic agreements, and international social issues such as human rights and the environment. Credit is awarded for one of the following POSC 020 or POSC 020H.

POSC 020H Honors World Politics 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to the University Honors. Program or consent of instructor. Honors course corresponding to POSC 020. Explores approaches to and models of international relations: theories, the causes of war, international organizations, cooperation and conflict, international political economy, regional economic agreements, and international social issues such as human rights and the environment. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of POSC 020 or POSC 020H.

POSC 045 Special Seminar in Political Science 1 Intensive examination of specific political arenas, utilizing the expertise of prominent political practitioners. Will be offered not more than once a quarter; can be repeated up to four times for credit.

Upper-Division Courses

POSC 100 Presidential Politics 4 Lecture, 3 hours; research, 1 hour; individual study, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Analyzes modern presidential leadership and power. Topics include the institutional presidency, presidential selection, and the presidency's relationships with the bureaucracy, Congress, interest groups, the press, and the public. Considers what makes presidents popular and what determines the effectiveness of presidential leadership.

POSC 101 The United States Congress 4 Lecture, 3 hours; research, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Analyzes the politics of the contemporary U.S. Congress. Topics include representation, elections, parties and leaders, committees, public policy, the history of the institution, and the relationships between Congress and the other branches of government.

POSC 102 Political Behavior in Comparative Perspective 4 Lecture, 3 hours; extra reading, 3 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introduces theories of public political behavior from a comparative perspective, including explanations from the political psychology, political sociology, and political economy perspectives. Topics include public ideology, political polarization, attitudes toward minority groups, parties, and welfare policies in European and American countries. Credit is awarded for one of the following POSC 102 or POSC 102S.

POSC 102S Political Behavior in Comparative Perspective 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introduces theories of public political behavior from a comparative perspective, including explanations from the political psychology, political sociology, and political economy perspectives. Topics include public ideology, political polarization, attitudes toward minority groups, parties, and welfare policies in European and American countries. Credit is awarded for one of the following POSC 102S or POSC 102.

POSC 103 Political Psychology 4 Lecture, 3 hours; written work, 1 hour; term paper, 1 hour; activity, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to political psychology theories. Explores different theoretical perspectives (including but not limited to) cognitive psychology, group psychology, social identity theory, and group conflict theory. Focuses on applications of those theories to study politics. Course is repeatable as content or topic changes to a maximum of 8 units. Credit is awarded for either or both "Political Psychology:American Politics" and "Polital Psychology:Comparative Politics." For each topic, students can take only the "S" or non-"S" version.

POSC 103S Political Psychology 5 Lecture, 3 hours; discussion, 1 hour; written work, 1 hour; term paper, 1 hour; activity, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to political psychology theories. Explores different theoretical perspectives (including but not limited to) cognitive psychology, group psychology, social identity theory, and group conflict theory. Focuses on applications of those theories to study politics. Course is repeatable as content or topic changes to a maximum of 10 units. Credit is awarded for either or both "Political Psychology:American Politics" and "Polital Psychology:Comparative Politics." For each topic, students can take only the "S" or non-"S" version.

POSC 104 Special Topics in the Politics of Race, Immigration, and Ethnicity 4 Lecture, 3 hours; extra reading, 2 hour; term paper, 1 hour. Prerequisite(s): upper-division standing; POSC 010 or POSC 010H or POSC 010W or consent of instructor. Provides an in-depth examination of the politics of race, immigration, and ethnicity in the United States. Emphasizes the role of political institutions and political behavior. Covers one of the following topics: African American Politics, Asian American Politics, Latino Politics, Native American Politics. Course is repeatable as topics change to a maximum of 12 units. Credit is not awarded to POSC 104 if it has already been awarded to POSC 104S if the content or topic are the same.

POSC 104S Special Topics in the Politics of Race, Immigration, and Ethnicity 5 Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing; POSC 010 or POSC 010H or POSC 010W or consent of instructor. Provides an in-depth examination of the politics of race, immigration, and ethnicity in the United States. Emphasizes the role of political institutions and political behavior. Covers one of the following topics: African American Politics, Asian American Politics, Latino Politics, Native American Politics. Course is repeatable as topics change to a maximum of 15 units. Credit is not awarded to POSC 104S if it has already been awarded to POSC 104 if the content or topic are the same.

POSC 105 Race and Law Enforcement 4 Seminar, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): POSC 010 or POSC 010H or POSC 010W or PBPL 001. Introduces the role of race and ethnicity in the historical and contemporary practice of law enforcement in the United States. Focuses on the scientific study of race and policing.

POSC 106 Environmental Political Thought 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Addresses various philosophical aspects of the human relationship to the environment from social, political, and economic perspectives. Includes debates related to issues such as how should human beings interact with their environment, as well as the relationship of environmental practice to liberalism, democracy, and capitalism. Cross-listed with SEHE 136. Credit is awarded for one of the following POSC 106, SEHE 136, POSC 106S, or SEHE 136S.

POSC 106S Environmental Political Thought 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Addresses various philosophical aspects of the human relationship to the environment from social, political, and economic perspectives. Includes debates related to issues such as how should human beings interact with their environment, as well as the relationship of environmental practice to liberalism, democracy, and capitalism. Cross-listed with SEHE 136S. Credit is awarded for one of the following POSC 106S, SEHE 136S, POSC 106, or SEHE 136.

POSC 107 Non Western Political Thought 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Explores some of the key political thinkers, ideas, and cultural-religious legacies of non-Western societies. Addresses pertinent non-Western civilizations and crucial problems in comparative political theory. Provides a detailed analysis of political thinking in regions such as the Middle East, South Asia, and East/Southeast Asia. Cross-listed with GBST 107.

POSC 108 Politics of Race, Immigration, and Ethnicity in the United States 5 Lecture, 3 hours; discussion, 1 hour; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): POSC 010 or POSC 010H or POSC 010W; restricted to class level standing of junior, or senior; or consent of instructor. Examines the politics of race, immigration, and ethnicity in the United States including comparisons between African Americans and Latino, Asian, and European immigrants. Emphasizes the role of institutions in shaping the importance of race to politics in the United States.

POSC 109 Political Religions and Religious Politics 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigation of major themes and issues in the intersection of religion and politics, such as the sacralization of politics, religious nationalisms, sacral kingship, revolutionary asceticism, "throne and altar," civil religion, millennialism, political myth and ritual, integralism, and the conformity of the polity to religious values. Cross-listed with RLST 173.

POSC 110 The Origins of Political Ideas 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the major schools of political thought of ancient times. Covers political philosophers such as Plato, Aristotle, Confucius, and Ashoka. Credit is awarded for only one of POSC 110 or POSC 110S.

POSC 110S The Origins of Political Ideas 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of the major schools of political thought of ancient times. Covers political philosophers such as Plato, Aristotle, Confucius, and Ashoka. Credit is awarded for only one of POSC 110 or POSC 110S.

POSC 111 Democracy and the Social Contract 4 Lecture, 3 hours; extra reading, 2 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of the major political philosophers of the social contract and their critics on issues such as individualism versus community; the roles of religion and markets in politics; and the adequacy of contract theory for women and minorities. Credit awarded for only one of POSC 111 or POSC 111S.

POSC 111S Democracy and the Social Contract 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of the major political philosophers of the social contract and their critics on issues such as individualism versus community; the roles of religion and markets in politics; and the adequacy of contract theory for women and minorities. Credit is awarded for only one of POSC 111 or POSC 111S.

POSC 112 Modern Political Theory 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Critically explores selected works of political theory from the eighteenth century to the present. Concentrates on issues such as freedom, utility, justice, nature, citizenship, toleration, equality and inequality, autonomy, democracy, power, rights, and identity. Credit is awarded for only one of POSC 112 or POSC 112S.

POSC 112S Modern Political Theory 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours; written work, 1 hour. Prerequisite(s): upper division standing or consent of instructor. Critically explores selected works of political theory from the eighteenth century to the present. Concentrates on issues such as freedom, utility, justice, nature, citizenship, toleration, equality and inequality, autonomy, democracy, power, rights, and identity. Credit is awarded for only one of POSC 112 or POSC 112S.

POSC 113 American Political Thought 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of developments in American political thought from the seventeenth century to the present.

POSC 114 Theory and Methodology of Political Science 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers the development and scope of political science as a discipline. Addresses selected theoretical and methodological issues in contemporary political and social science. Credit is awarded for only one of POSC 114, POSC 114H, or POSC 114S.

POSC 114H Honors Theory and Methodology of Political Science 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing, admission to University Honors; or consent of instructor. Honors course corresponding to POSC 114 and POSC 114S. Covers the development and scope of political science as a discipline. Addresses selected theoretical and methodological issues in contemporary political and social science. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of POSC 114, POSC 114H, or POSC 114S.

POSC 114L Theory and Methodology of Political Science 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): and consent of instructor. Covers analytical approaches used in contemporary political science emphasizing practical application. Addresses research design, research ethics, data collection and management, and public engagement. Utilizes a lab model to offer practical skills training in research methods.

POSC 114S Theory and Methodology of Political Science 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers the development and scope of political science as a discipline. Addresses selected theoretical and methodological issues in contemporary political and social science. Credit is awarded for only one of POSC 114, POSC 114H, or POSC 114S.

POSC 115 Utopia and Dystopia 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing. Examines the political theory of utopian literature from ancient Greece to the present including analysis of utopian and dystopian elements in each work. Authors include Plato, Thomas More, James Harrington, Ernest Callenbach, and Katherine Forrest. Credit is awarded for only one of POSC 115 or POSC 115S.

POSC 115S Utopia and Dystopia 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing. Examines the political theory of utopian literature from ancient Greece to the present including analysis of utopian and dystopian elements in each work. Authors include Plato, Thomas More, James Harrington, Ernest Callenbach, and Katherine Forrest. Credit is awarded for only one of POSC 115 or POSC 115S.

POSC 116 Capitalism, Socialism, and Political Theory 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines debates about economic life. Focuses on issues such as markets and marketization, labor, globalization, freedom, class, corporations, democracy, the welfare state, and power. Credit is awarded for only one of POSC 116 or POSC 116S.

POSC 116S Capitalism, Socialism, and Political Theory 5 Lecture, 3 hours; discussion, 1 hour; written work, 1 hours; extra reading, 3 hours. Prerequisite(s): upper division standing or consent of instructor. Examines debates about economic life. Focuses on issues such as markets and marketization, labor, globalization, freedom, class, corporation, democracy, the welfare state, and power. Credit is awarded for only one of POSC 116 or POSC 116S.

POSC 117 Contemporary Democratic Theory 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A critical survey of the principal approaches to thinking about democracy since the World War II. May cover elite, pluralist, deliberative and participatory theories. Addresses questions about inclusiveness, and the optimal character and scope of democracy. Credit is awarded for only one of POSC 117 or POSC 117S.

POSC 117S Contemporary Democratic Theory 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours; written work, 1 hour. Prerequisite(s): upper division standing or consent of instructor. A critical survey of the principal approaches to thinking about democracy since World War II. May cover elite, pluralist, deliberative, and participatory theories. Addresses questions about inclusiveness and the optimal character and scope of democracy. Credit is awarded for only one of POSC 117 or POSC 117S.

POSC 119 Political Thinkers in Depth 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing. Intensive reading of one or more great political thinkers from around the world, with special attention to contested readings of each figure. Examples might include Plato, Confucius, Machiavelli, Marx and Engels, John Stuart Mill, or Gandhi.

POSC 120 The Politics of India and Pakistan 4 Lecture, 3 hours; extra reading and term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the domestic and international politics of India and Pakistan, with attention to other South Asian countries. Explores nationalist movements, struggles for development, contrasting experiences with democracy and dictatorship, and internal and external conflicts.

POSC 121 Monarchy 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A cross-cultural survey of the institution of monarchy in the ancient world and its role in political, social, economic, and religious life. Cross-listed with CPAC121, and CLA121. Credit is awarded for only one of CLA 121/CPAC 121/POSC 121 or CLA 121S/CPAC 121S/POSC 121S.

POSC 121S Monarchy 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the cross-cultural survey of the institution of monarchy in the ancient world and its role in political, social, economic, and religious life. Cross-listed with CLA 121S, and CPAC 121S. Credit is awarded for only one of CLA 121/CPAC 121/POSC 121 or CLA 121S/CPAC 121S/POSC 121S.

POSC 122 Skepticism and Liberalism 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores the origins of the modern way of thinking about politics (i.e., liberalism in a sense that includes both conservatives and liberals) by the ancient and early modern skeptics such as Montaigne, Spinoza, Hume, and Kant. Credit is awarded for only one of POSC 122 or POSC 122S.

POSC 122S Skepticism and Liberalism 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores the origins of the modern way of thinking about politics (i.e., liberalism in a sense that includes both conservatives and liberals) by the ancient and early modern skeptics such as Montaigne, Spinoza, Hume, and Kant. Credit is awarded for only one of POSC 122 or POSC 122S.

POSC 123 Conflict Resolution 4 Lecture, 3 hours; extra reading, 1 hour; term paper, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of conflict resolution in international relations and domestic conflict. Topics covered include theories of conflict and conflict resolution, negotiation, the role of external powers, mediation, and peacekeeping.

POSC 124 International Relations 4 Lecture, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): POSC 020. An in-depth consideration of the major theories of contemporary international relations. Focuses on core issues in international security affairs, such as the causes of war and peace, cooperation and conflict, alliances, perception and misperception, ethnic conflict, and the link between democracy and war. Credit is awarded for only one of POSC 124 or POSC 124S.

POSC 124S International Relations 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): POSC 020; upper-division standing or consent of instructor. An in-depth consideration of the major theories of contemporary international relations. Focuses on core issues in international security affairs, such as the causes of war and peace, cooperation and conflict, alliances, perception and misperception, ethnic conflict, and the link between democracy and war. Credit is awarded for only one of POSC 124 or POSC 124S.

POSC 125 United States Foreign Policy Since World War 2 4 Lecture, 3 hours; research, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A survey and evaluation of the major developments in U.S. foreign policy from 1945 to the present. Focuses on relations with the Soviet Union, its successor states, and the Third World, within which the uses of force and diplomacy are emphasized.

POSC 126 The Politics of International Trade, Finance, and Development 4 Lecture, 3 hours; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): POSC 020 or POSC 020H; restricted to class level standing of junior, or senior. Studies the interaction between international economics and world politics. Focuses on the evolution of the institutions governing world trade and finance; role of multinational corporations; Third World debt and development; the European Union; economic reform in transitional economies; gender; economics and environment; and role of technology in international political economy. Credit is awarded for one of the following POSC 126 or POSC 126S.

POSC 126S The Politics of International Trade, Finance, and Development 5 Lecture, 3 hours; discussion, 1 hour; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): POSC 020 or POSC 020H. Studies the interaction between international economics and world politics. Focuses on the evolution of the institutions governing world trade and finance; role of multinational corporations; Third World debt and development; the European Union; economic reform in transitional economies; gender; economics and environment; and role of technology in international political economy. Credit is awarded for one of the following POSC 126S or POSC 126.

POSC 127 Global Environmental Politics 4 Lecture, 3 hours; field, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): POSC 020 or POSC 020H. Introduces the study and practice of global environmental politics. Explores major developments in the evolution of international environmental law and policy. Covers ozone depletion, acid rain, marine pollution and whaling, tropical deforestation, overpopulation, and the impact of environmental degradation. Cross-listed with SEHE 127. Credit is awarded for one of the following POSC 127, SEHE 127, POSC 127S, or SEHE 127S.

POSC 127S Global Environmental Politics 5 Lecture, 3 hours; discussion, 1 hour; field, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): POSC 020 or POSC 020H. Introduces the study and practice of global environmental politics. Explores the major developments in the evolution of international environmental law and policy. Covers ozone depletion, acid rain, marine pollution and whaling, tropical deforestation, overpopulation, and the impact of environmental degradation. Cross-listed with SEHE 127S. Credit is awarded for one of the following POSC 127S, SEHE 127S, or POSC 127.

POSC 128 Comparative Foreign Policy 4 Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Compares foreign policies of selected countries. Focuses on applying various approaches to foreign policy analysis including societal, bureaucratic and decision-making theories of foreign policy.

POSC 129 The Proliferation of Weapons of Mass Destruction 4 Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing. Introduces students to the politics of weapons of mass destruction, including nuclear, chemical, and biological weapons. Topics covered include why states develop such weapons and whether possession of them increases or decreases the likelihood of war. Also covered are international efforts to stop weapons proliferation, and specific cases of proliferation such as those in India, and Pakistan, North Korea, Iraq, and Iran.

POSC 130 Politics and Economics of the Pacific Rim 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Provides a broad understanding of the politics and economics of countries that border the Pacific Rim, such as Japan, South Korea, Singapore, Taiwan, and

China, and of their relationship to the United States. Addresses major issues including economic growth, sociopolitical development, trade, and interdependence.

POSC 131 Black Political Thought 4 Lecture, 3 hours; extra reading, 1 hour; activity, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines approaches and evaluates what is at stake in engaging and producing Black political thought. Focuses on to the Black experience in the context of the United States but also covers African and Caribbean thinkers. Topics include freedom, democracy, liberation, futurity, community, radical imagining, and state-sanctioned violence. Cross-listed with BLKS 118.

POSC 132 Postconflict Justice and Reconciliation 4 Lecture, 3 hours; term paper, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing. Examines a range of strategies for pursuing justice and reconciliation in the aftermath of war and other forms of violent conflict. Topics include the laws of war theory, international criminal justice, truth commissions, and restorative justice. Credit is awarded for only one of POSC 132 or POSC 132S.

POSC 132S Postconflict Justice and Reconciliation 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing. Examines a range of strategies for pursuing justice and reconciliation in the aftermath of war and other forms of violent conflict. Topics include the laws of war, just war theory, international criminal justice, truth commissions, and restorative justice. Credit is awarded for only one of POSC 132 or POSC 132S.

POSC 134 Political Economy of International Finance 4 Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines historical and contemporary issues in international money finance. Explores how financial globalization shaped policy decisions at the national and the international level. Utilizes examples from developed and developing countries with different political and legal regimes. Credit is awarded for only one of POSC 134 or POSC 134S.

POSC 134S Political Economy of International Finance 5 Lecture, 3 hours; discussion, 1 hour; individual study, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines historical and contemporary issues in international money finance. Explores how financial globalization shaped policy decisions at the national and the international level. Utilizes examples from developed and developing countries with different political and legal regimes. Credit is awarded for only one of POSC 134 or POSC 134S.

POSC 136 Political Economy of International Migration 4 Lecture, 3 hours; extra reading, 1 hour; individual study, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the political and economic causes and consequences of international migration. Explores the effects of migration in both sending and receiving countries and how policymakers respond to these effects. Focuses on public opinion formation, interest group politics, immigration policy making, brain drain, remittances, diaspora engagement policies, and refugee policy. Credit is awarded for only one of POSC 136 or POSC 136S.

POSC 136S Political Economy of International Migration 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 1 hour; individual study, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the political and economic causes and consequences of international migration. Explores the effects of migration in both sending and receiving countries and how policymakers respond to these effects. Focuses on public opinion formation, interest group politics, immigration policymaking, brain drain, remittances, diaspora engagement policies, and refugee policy. Credit is awarded for only one of POSC 136 or POSC 136S.

POSC 137 Environmental Justice and Human Rights 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines how notions of justice and human rights have been brought to bear on environmental and sustainability debates. Also examines the theoretical and historical basis of the environmental justice and human rights movements. Topics include local concerns (including "food deserts") and air pollution, as well as global problems. Cross-listed with SEHE 137. Credit is awarded for one of the following POSC 137, SEHE 137, POSC 137S, or SEHE 137S.

POSC 137S Environmental Justice and Human Rights 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines how notions of justice and human rights have been brought to bear on environmental and sustainability debates. Also examines the theoretical and historical basis of the environmental justice and human rights movements. Topics include local concerns (including "food deserts") and air pollution, as well as global problems. Cross-listed with SEHE 137S. Credit is awarded for one of the following POSC 137S, SEHE 137S, POSC 137, or SEHE 137.

POSC 138 Labor and Globalization 4 Lecture, 3 hours; individual study, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the relationship between globalization and labor. Focuses on four key political actors that shape the workers' fates in the global economy: transnational corporations, national governments, international organizations, and workers themselves. Cross-listed with LABR 138. Credit is awarded for one of the following POSC 138, LABR 138, LABR 138S, or POSC 138S.

POSC 138S Labor and Globalization 5 Lecture, 3 hours; discussion, 1 hour; individual study, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the relationship between globalization and labor. Focuses on four key political actors that shape the workers' fates in the global economy: transnational corporations, national governments, international organizations, and workers themselves. Cross-listed with LABR 138S. Credit is awarded for one of the following POSC 138S, LABR 138S, LABR 138, or POSC 138.

POSC 139 Environment, Sustainability, and Society 4 Lecture, 3 hours; individual study, 2 hours; written work, 1 hour. Prerequisite(s): POSC 017 or POSC 020 or POSC 020H or SOC 020; or consent of instructor. Examines the relationship of human society to the natural environment from a multi disciplinary approach. Considers ways in which values, paradigms, policies, technologies, and their interactions have determined humans' current unsustainable relationship with the earth. Explores challenges inherent in moving society toward a more environmentally sustainable future. Cross-listed with SEHE 139. Credit is awarded for one of the following POSC 139, SEHE 139, POSC 139S, or SEHE 139S.

POSC 139S Environment, Sustainability, and Society 5 Lecture, 3 hours; discussion, 1 hour; individual study, 2 hours; written work, 1 hour. Prerequisite(s): POSC 017 or POSC 020 or POSC 020H or SOC 020; or consent of instructor. Examines the relationship of human society to the natural environment from a multi disciplinary approach. Considers the ways in which values, paradigms, policies, technologies, and their interactions have determined humans' current unsustainable relationship with the earth. Explores challenges inherent in moving society toward a more environmentally sustainable future. Cross-listed with SEHE 139S. Credit is awarded for one of the following POSC 139S, SEHE 139S, POSC 139, or SEHE 139.

POSC 140 Militarism and Hegemony in the Ancient World 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): CHN 030 or AST 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or HISE 110 or CLA 112 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CLA 120E or CPAC 102 or CLA 102 or CPAC 112 or CLA 113 or HISE 113 or CPAC 121 or CLA 121 or POSC 121 or CPAC 132 or AST 132 or CHN 132 or CLA 132 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CLA 143 or CPAC 143 or CHN 143 or RLST 143 or CLA 120F or CLA 120G or CLA 120J or CPLT 030; restricted to class level standing of junior, or senior; or consent of instructor. Comparative study of ancient warfare and hegemony in two or more civilizations of the ancient world. Perspectives may include social and political contexts, gender and war, acquisition of empire,

religious wars, and weapons, strategies and tactics in theory and practice. Study of primary source material in texts and visual arts. Cross-listed with AST 145, CHN 141, CLA 141, and CPAC 141.

POSC 141 Women and the American Political Process 4 Lecture, 3 hours; individual study, 1 hour; term paper, 1 hour; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A general introduction to the field of women and politics. Explores the ways in which gender enters and shapes politics, primarily in the U.S. context. Topics include women's activism, voting behavior, and opinions. Also addresses women as candidates and in government.

POSC 142 (E-Z) Simulation Laboratory 2 to 4 Participation in and analysis of laboratory models of complex political systems.

POSC 142L The United Nations 2 Lecture, 2 hours. Prerequisite(s): . Examination of the structure and functioning of the United Nations with major emphasis on the principal organs (Security Council, General Assembly), ECOSOC, the Trusteeship Council and the leading committees. The course will examine theories on the pacific settlement of disputes, collective security and functionalism. The focus will be on the United Nations as a living, contemporary political institution.

POSC 142M Model United Nations: Country Studies (simulation) 2 Simulation, 2 hours, Prerequisite(s): POSC 142L. An intensive study of the foreign policy of two selected countries, normally one developed and one undeveloped country, conducted through lectures, discussion, and simulations of their foreign policies being projected in the arena of the United Nations. Can be repeated twice for a total of 6 units.

POSC 143 Elections and Political Participation 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An examination of political behavior in the United States with emphasis on political participation and voting behavior. Credit is awarded for only one of POSC 143 or POSC 143S.

POSC 143S Elections and Political Participation 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An examination of political behavior in the United States with emphasis on political participation and voting behavior. Credit is awarded for only one of POSC 143 or POSC 143S.

POSC 144 Politics Through Film 4 Lecture, 3 hours; screening, 0.5 hour; extra reading, 1 hour; term paper, 1.5 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Explores how the values of democracy inform the operation of government, using film. Topics include collective action, principal-agent problems, equality, liberty, popular sovereignty, and strategic behavior. Credit is awarded for one of the following POSC 144 or POSC 144S.

POSC 144S Politics Through Film 5 Lecture, 3 hours; discussion, 1 hour; screening, 0.5 hour; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Explores how the values of democracy inform the operation of government, using film. Topics include collective action, principal-agent problems, equality, liberty, popular sovereignty, and strategic behavior. Credit is awarded for one of the following POSC 144S or POSC 144.

POSC 145 Money in American Politics 4 Lecture, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): POSC 010 or POSC 010H or POSC 010W; or consent of instructor. Analyzes the role of money in elections and in formulation of public policy. Examines the role of parties in raising and spending campaign money, the explosion of "soft money" in congressional and presidential elections, and the effect of campaign spending on electoral outcomes. Explores how campaign contributions influence public policy.

POSC 146 Mass Media and Public Opinion 4 Lecture, 3 hours; term paper and reading, 1 hour. Prerequisite(s): . Analysis of public opinion--character, sources, and functions--and especially its relationship to mass media. Particular attention will be devoted to the role and importance of television in American politics.

POSC 147 Political Theory of Globalization 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing; PHIL 001 or PHIL 001H or POSC 005 or POSC 005H or POSC 005W. Examines how the phenomenon of globalization has been theorized within the discipline of political philosophy. Covers how the effects of globalization have been addressed by leading political theorists. Focuses on concepts such as cosmopolitanism, nation-states and citizenship, cultural diversity, moral universalism, and international distributive justice. Credit is awarded for only one of POSC 147 or POSC 147S.

POSC 147S Political Theory of Globalization 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing; PHIL 001 or PHIL 001H or POSC 005 or POSC 005H or POSC 005W. Examines how the phenomenon of globalization has been theorized within the discipline of political philosophy. Covers how the effects of globalization have been addressed by leading political theorists. Focuses on concepts such as cosmopolitanism, nation-states and citizenship, cultural diversity, moral universalism, and international distributive justice. Credit is awarded for only one of POSC 147 or POSC 147S.

POSC 148 Politics of Congressional Elections 4 Lecture, 3 hours; term paper, 2 hours; individual study, 1 hour. Prerequisite(s): upper-division standing, POSC 010 or POSC 010H or POSC 010W; or consent of instructor. An introduction to the politics of congressional elections. Topics include campaigning for Congress, strategic behavior in the decision to run for election, incumbency, and money in congressional elections. Credit is awarded for only one of POSC 148, POSC 148H, or POSC 148S.

POSC 148H Honors Politics of Congressional Elections 5 Lecture, 3 hours; discussion, 1 hour; term paper, 2 hours; extra reading, 1 hour. Prerequisite(s): admission to University Honors, upper-division standing, POSC 010 or POSC 010H or POSC 010W; or consent of instructor. Honors course corresponding to POSC 148 and POSC 148S. An introduction to the politics of Congressional elections. Topics include campaigning for congress, strategic behavior in the decision to run for election, incumbency, and money in congressional elections. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of POSC 148, POSC 148H, or POSC148S.

POSC 148S Politics of Congressional Elections 5 Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): upper-division standing, POSC 010 or POSC 010H or POSC 010W; or consent of instructor. An introduction to the politics of congressional elections. Topics include campaigning for Congress, strategic behavior in the decision to run for election, incumbency, and money in congressional elections. Credit is awarded for only one of POSC 148, POSC 148H, or POSC 148S.

POSC 149 Presidential Elections 4 Lecture, 3 hours; laboratory, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): Restricted to class level standing of junior, or senior. Examines the politics of presidential elections. Topics include presidential primaries, the presidential general election, campaigns, the role of parties, candidate behavior, public opinion and voting choice, and the influence of money. May include hands-on exploration of public opinion and demographic data to explore individual-level voter decision making. Credit is awarded for one of the following POSC 149 or POSC 149S.

POSC 149S Presidential Elections 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): Restricted to class level standing of junior, or senior. Examines the politics of presidential elections. Topics include presidential primaries, the presidential general election, campaigns, the role of parties, candidate behavior, public opinion and voting choice, and the influence of money. May include hands-on exploration of public opinion and demographic data to explore individual-level voter decision making. Credit is awarded for one of the following POSC 149S or POSC 149.

POSC 150 Human Rights in Theory, Law, and Politics 4 Lecture, 3 hours; extra reading, 2 hour; written work, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the theory, politics, and law of human rights. Examines the emergence of human rights institutions since World War II and ongoing dilemmas in the field. Topics include

cultural relativism, criminal tribunals, truth commissions, and refugees. Credit is awarded for only one of POSC 150 or POSC 150S.

POSC 150S Human Rights in Theory, Law, and Politics 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the theory, politics, and law of human rights. Examines the emergence of human rights institutions since World War II and ongoing dilemmas in the field. Topics include cultural relativism, criminal tribunals, truth commissions, and refugees. Credit is awarded for only one of POSC 150 or POSC 150S.

POSC 151 African Politics 4 Lecture, 3 hours; extra reading, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): Restricted to class level standing of Junior, or Senior; Or the consent of instructor; Examines politics in African countries, with a focus on the contemporary period. Covers both political institutions and political behavior. Topics include role of the state, democracy vs. dictatorship, political participation, public goods provision, and development. Credit is awarded for only one of POSC 151 or POSC 151S.

POSC 151S African Politics 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): Restricted to class level standing of Junior, or Senior; or the consent of instructor. Examines politics in African countries, with a focus on the contemporary period. Covers both political institutions and political behavior. Topics include role of the state, democracy vs. dictatorship, political participation, public goods provision, and development. Credit is awarded for only one of POSC 151S or POSC 151.

POSC 153 Russian Foreign Policy 4 Lecture, 3 hours; extra reading, 3 hours; term paper, 3 hours. Prerequisite(s): POSC 020 or POSC 020H; restricted to class level standing of junior, or senior; or consent of instructor. Examines contemporary Russian foreign policy. Emphasizes historical legacies, competing perspectives on the policy process, and evaluation of Russia's policies with key countries. Utilizes various international relations theories and concepts to aid in understanding Russian foreign policy.

POSC 154 Politics of the European Union 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the formation of the European Union, its institutional structure, and its policy-making processes. Explores its role in Europe and in the world in the face of political and economic challenges.

POSC 155 Government and Politics in Western Europe 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A comparative study of government and politics in Western Europe and how economic and cultural factors influence their formation. Analyzes how parties, bureaucracy, legislatures, and executives influence the political life of Western Europe. Focuses on the governing bodies in Britain, France, and Germany. Credit is awarded for one of the following POSC 155 or POSC 155S.

POSC 155S Government and Politics in Western Europe 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A comparative study of government and politics in Western Europe and how economic and cultural factors influence their formation. Analyzes how parties, bureaucracy, legislatures, and executives influence the political life of Western Europe. Focuses on the governing bodies in Britain, France, and Germany. Credit is awarded for one of the following POSC 155S or POSC 155.

POSC 157 Modern Dictatorships 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Considers how dictatorships come to power and abuse that power. Also explores the dilemmas dictatorships faced, their successes, and why they met ultimate defeat. Includes study of dictatorships in Argentina, Chile, Haiti, Guatemala and Syria. Credit is awarded for only one of POSC 157 or POSC 157S.

POSC 157S Modern Dictatorships 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Considers how dictatorships come to power and abuse that power. Also explores the dilemmas dictatorships faced, their successes, and why they met ultimate defeat. Includes study of dictatorships in Argentina, Chile, Haiti, Guatemala and Syria. Credit is awarded for only one of POSC 157 or POSC 157S.

POSC 158 Politics of Mexico 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A survey of contemporary Mexican politics. Emphasis is on recent economic and social changes and their impact on Mexico's political system. Topics include relations with the United States, the rise of drug trafficking in Mexico, and the recent emergence of opposition politics. Cross-listed with LNST 148.

POSC 159 The Armed Forces and Politics 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the origins, nature, and behavior of the military within political systems. Focuses on the political interaction between the armed forces and civilians. Topics include military intervention, democracy, human rights, missions, defense organizations, and civilian control. Explores case studies of the United States, Russia, and countries from Latin America and Asia. Credit is awarded for only one of POSC 159 or POSC 159S.

POSC 159S The Armed Forces and Politics 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the origins, nature, and behavior of the military within political systems. Focuses on the interaction between the armed forces and civilians, as well as the origins of military subordination and insubordination. Topics include military intervention, civilian control strategies, military missions, defense organization, civil-military relations in peace and wartime, and human rights. Covers case studies from Latin America, the United States, Russia, and Eastern Europe. Credit is awarded for only one of POSC 159 or POSC 159S.

POSC 160 Globalization and Development 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores the relationship between globalization and development in historical and contemporary context through key perspectives on global inequality, development strategies, governance, institutions, and technology. Credit is awarded for one of the following POSC 160 or POSC 160S.

POSC 160S Globalization and Development 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Explores the relationship between globalization and development in historical and contemporary context through key perspectives on global inequality, development strategies, governance, institutions, and technology. Credit is awarded for one of the following POSC 160S or POSC 160.

POSC 161 United States and Latin American Relations 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Explores international relations between the United States and the nations of Latin America. Examines different theories for explaining changes in the conduct of U.S.-Latin American relations over time. Topics include democracy and empire, revolution and counter-insurgency, economic integration and trade, petroleum politics, drug trafficking, and migration flows. Cross-listed with LNST 188.

POSC 162 Latin America: the Quest For Development and Democracy 4 Lecture, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A comparative examination of central issues in and components of Latin American political life. Covers economic development, regimes and alliances, guerrilla wars, the armed forces, human rights, and democratic consolidation. Includes Argentina, Chile, Venezuela, and Peru. Cross-listed with LNST 142. Credit is awarded for one of the following POSC 162, LNST 142, LNST 142S, or POSC 162S.

POSC 162S Latin America: the Quest For Development and Democracy 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. A comparative examination of central issues in and components of Latin American political life. Covers economic development, regimes and alliances, guerrilla wars, the armed forces, human rights, and democratic consolidation. Includes Argentina, Chile, Venezuela, and Peru. Cross-listed with LNST 142S. Credit is awarded for one of the following POSC 162S, LNST 142S, LNST 142, or POSC 162.

POSC 163 Ethnic Politics 4 Lecture, 3 hours; individual study, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the politics of ethnicity. Surveys theory and evidence utilizing a wide range of cases from around the world. Credit is awarded for only one of POSC 163 or POSC 163S.

POSC 163S Ethnic Politics 5 Lecture, 3 hours; discussion, 1 hour; individual study, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the politics of ethnicity. Surveys theory and evidence utilizing a wide range of cases from around the world. Credit is awarded for only one of POSC 163 or POSC 163S.

POSC 164 The Nation State and Capitalism 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers the comparative political economy of advanced industrial countries. Examines forms of capitalism after World War II. Studies political foundations and institutional features and their relation to economic growth, investment, innovation, international trade, employment, and economic quality. Analyzes the impact of globalization on labor relations, social welfare, financial market regulation, and corporate governance. Credit is awarded for only one of POSC 164 or POSC 164S.

POSC 164S The Nation State and Capitalism 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Covers the comparative political economy of advanced industrial countries. Examines forms of capitalism after World War II. Studies political foundations and institutional features and their relation to economic growth, investment, innovation, international trade, employment, and economic quality. Analyzes the impact of globalization on labor relations, social welfare, financial market regulation, and corporate governance. Credit is awarded for only one of POSC 164 or POSC 164S.

POSC 165 Strategy and Politics 4 Lecture, 3 hours; individual study, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the formal analysis of politics, the role of strategic behavior, and the importance of political institutions in influencing political outcomes. Covers the basics of social choice and game theory and their applications to strategic voting, bargaining, cooperation, agenda setting, executive vetoes, conflict, and legislative bargaining. Credit is awarded for only one of POSC 165 or POSC 165S.

POSC 165S Strategy and Politics 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the formal analysis of politics, the role of strategic behavior, and the importance of political institutions in influencing political outcomes. Covers the basics of social choice and game theory and their applications to strategic voting, bargaining, cooperation, agenda setting, executive vetoes, conflict, and legislative bargaining. Credit is awarded for only one of POSC 165 or POSC 165S.

POSC 166 Judicial Politics and Policy Making 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An examination of the characteristics of judicial bodies, emphasizing their interaction with other policy-makers and social and political problems. Investigates the policy roles of local, state, and lower federal courts and the U.S. Supreme Court.

POSC 167 Constitutional Law: Fundamental Freedoms 5 Lecture, 3 hours; discussion, 1 hour; research, 1 hour; individual study, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of the legal and political context in the U.S. of freedom of expression, the press, and religion; separation of church and state; equal rights for women and minorities; voting rights; and citizenship.

POSC 168 Constitutional Law: Criminal Justice 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An examination of the rights of criminal defendants; the role of lawyers, police, prosecutors, and judges in the criminal process in the United States; and the function of criminal law.

POSC 169 Terrorism and Political Violence 4 Lecture, 3 hours; extra reading and term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the nature and origin of political conflict, violence, and rebellion. Examines political violence as a political pathology and as an instrument of supporters and opponents of regimes. Examines types of political violence: terrorism, ethnic and communal conflict, rebellion, and revolutionary and counter-revolutionary violence.

POSC 170 Local Leadership in California 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An examination of the local leadership structure, official and unofficial, in California. Analyzes who decides and influences local policy decisions.

POSC 171 American State Politics 4 Lecture, 3 hours; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A critical examination of the activities, structure, and function of the states in the American political system. Focuses on the politics and major policy issues of the 50 states with a special interest in California. Credit is awarded for one of the following POSC 171 or POSC 171S.

POSC 171S American State Politics 5 Lecture, 3 hours; discussion, 1 hour; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A critical examination of the activities, structure, and function of the states in the American political system. Focuses on the politics and major policy issues of the 50 states with a special interest in California. Credit is awarded for one of the following POSC 171S or POSC 171.

POSC 173 Government and Politics of California 4 Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the political process of California. Focuses on both the electoral and legislative politics and the contribution they make to democratic governance under conditions of social diversity. Credit is awarded for only one of POSC 173 or POSC 173S.

POSC 173S Government and Politics of California 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 1 hour; individual study, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the political process of California. Focuses on both the electoral and legislative politics and the contribution they make to democratic governance under conditions of social diversity. Credit is awarded for only one of POSC 173 or POSC 173S.

POSC 175H Introduction to the Honors Thesis 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Familiarizes students with the procedures and techniques, from theory construction to data collection and analysis, needed to design and conduct original research for an honors thesis. Satisfactory (S) or No Credit (NC) grading is not available.

POSC 176H Seminar On Writing the Honors Thesis 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): POSC 175H; upper-division standing or consent of instructor. Provides guidance for students writing an honors thesis in political science. Topics include bibliographic research, fieldwork, statistics, case study analysis, professional writing, and standards of academic scholarship. Satisfactory (S) or No Credit (NC) grading is not available.

POSC 177H Honors Thesis 1 to 4 Thesis, 3 to 12 hours. Prerequisite(s): POSC 175H; POSC 176H; upper-division standing or consent of instructor. Independent research and

preparation of an honors thesis completed under the supervision of a faculty member. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 12 units.

POSC 178 Political Consequences of Electoral Institutions 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the structures of the various electoral systems used around the world. Explores how different electoral systems influence the choices made by voters and political candidates. Analyzes how these choices influence factors including representation, accountability, party systems, corruption, and economic growth. Credit is awarded for only one of POSC 178 or POSC 178S.

POSC 178S Political Consequences of Electoral Institutions 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An examination of how the wide variety of electoral systems that are used in the world function. Explores how different electoral systems influence the choices made by voters and political candidates. Analyzes how these choices influences factors including representation, accountability, party systems, corruption, and economic growth. Credit is awarded for only one of POSC 178 or POSC 178S.

POSC 180 The Politics of Public Health 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on the social, environmental, and political factors that shape population health. Utilizes public health topics to illustrate the fundamental problems of the politics of regulation and social policy. Credit is awarded for only one of POSC 180 or POSC 180S.

POSC 180S The Politics of Public Health 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Focuses on the social, environmental, and political factors that shape population health. Utilizes public health topics to illustrate the fundamental problems of the politics of regulation and social policy. Credit is awarded for one of the following POSC 180S or POSC 180.

POSC 181 Public Policy: Values, Conflict, and Politics 4 Lecture, 3 hours; research, 1 hour; individual study, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing; POSC 010 or POSC 010H or POSC 010W. Introduces methods and approaches used to describe, explain, and evaluate public policies. Examples include group theories, system approaches, program planning, and budgeting systems.

POSC 182 (E-Z) Politics and Economic Policy 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the political and administrative processes of economic policy formation, the rationale of government programs, and the mixture of facts, values, and social forces that determine policy. Emphasizes issues of government-economy interaction emerging under the impact of modern technology. Segment G may be offered online or in-person. E. Politics And Economic Policy: American Politics; F. Politics And Economic Policy: International Relations; G. Politics And Economic Policy: Strategy And Institutions.

POSC 183 (E-Z) Administrative Politics and Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): POSC 010 or POSC 010H or POSC 010W; restricted to class level standing of junior, or senior. An introduction to the politics and theory of public administration.

POSC 183E Bureaucratic Politics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): POSC 010 or POSC 010H or POSC 010W; restricted to class level standing of junior, or senior. Examines the politics and theory of public administration, with a focus on bureaucratic politics. Topics may include decision-making processes, leadership, formal and informal organizations, and the interrelationships among values, structures, and behavioral patterns.

POSC 183F Strategies of Compliance 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): POSC 010 or POSC 010H or POSC 010W; restricted to class level standing of junior, or senior. Examines the politics and theory of public administration focusing on compliance. Topics may include decision-making processes, leadership, formal and informal organizations, and the interrelationships among values, structures, and behavioral patterns.

POSC 184 Digital Government 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores extent to which digital communication technologies transform the institutions and practice of democratic government in the United States. Topics include the impact of communication technology on campaigning, legislative representation, agency rulemaking, and deliberation. Also addresses the legal, regulatory, and political context of public sector technology. Credit is awarded for one of the following POSC 184 or POSC 184S.

POSC 184S Digital Government 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores extent to which digital communication technologies transform the institutions and practice of democratic government in the United States. Topics include the impact of communication technology on campaigning, legislative representation, agency rulemaking, and deliberation. Also addresses the legal, regulatory, and political context of public sector technology. Credit is awarded for one of the following POSC 184S or POSC 184.

POSC 186 Regulation: A Political Perspective 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines government regulation from a political perspective, covering both traditional areas of business regulation and the newer social regulation in areas of environment, health and safety, and personal behavior. Evaluates rationales for and against regulation, in theory and through case studies.

POSC 188 Political Violence in Latin America 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the nature, origins, and purposes of political violence in Latin America. Examines different forms of violence perpetuated by states, insurgents, military, police, and organized crime. Includes case studies of repression in Argentina, genocide in Guatemala, counter-insurgency in Colombia, and drug-related violence in Mexico, Brazil, and Central America. Credit is awarded for only one of POSC 188 or POSC 188S.

POSC 188S Political Violence in Latin America 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the nature, origins, and purposes of political violence in Latin America. Examines different forms of violence perpetuated by states, insurgents, military, police, and organized crime. Includes case studies of repression in Argentina, genocide in Guatemala, counter-insurgency in Colombia, and drug-related violence in Mexico, Brazil, and Central America. Credit is awarded for only one of POSC 188 or POSC 188S.

POSC 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): consent of instructor and department chair. Student prepares a written proposal endorsed by a supervising instructor, as a means of meeting individual curricular needs. Course is repeatable to a maximum of 15 units.

POSC 196A Moot Court A: Legal Research, Writing, and Advocacy 4 Seminar, 4 hours. Prerequisite(s): POSC 167 or POSC 168 or PHIL 007; restricted to class level standing of junior, or senior; 3.4 GPA; or consent of instructor. Introduction to the judicial process and legal argument. Explores how attorneys devise and make legal arguments, oral presentations, argument skills. Addresses the basics of legal analysis. Credit is awarded for one of the following POSC 196A or POSC 196. Credit is awarded for only one of POSC 196 or 196A

POSC 196B Moot Court B: Moot Court Competition 3 Seminar, 3 hours. Prerequisite(s): POSC 196A; restricted to class level standing of senior; and consent of instructor. Builds on the skills developed in POSC 196A. Focuses on writing an appellate brief and orally arguing an appeal. Includes participation in the American Moot Court Association competition against other colleges and universities across the nation.

POSC 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): consent of instructor. Offers opportunity for directed individual research, to result in a substantial paper, when a student wishes to do a deeper study of a topic than is possible in the normal term paper.

POSC 198G Field Work 1 to 12 Lecture, 1 hour; field, 3 to 9 hours; written work, 2 to 24 hours; consultation, 3.5 hours per quarter. Prerequisite(s): consent of instructor. Direct evaluation of the local political process through participant observation, combining academic instruction and supervised field work. Students will examine firsthand political behavior and the policy process in one location in local political systems. Course is repeatable to a maximum of 16 units.

POSC 198I Individual Internship in Political Science 1 to 12 Internship, 2 to 24 hours; reading and writing, 1 to 12 hours. Prerequisite(s): a GPA of 2.70 or better; upper-division standing; consent of instructor. Intern assignments in major political offices. Students participate in and observe substantive theoretical analyses of political behavior and policy processes. Course is repeatable to a maximum of 16 units.

POSC 199 Senior Research 1 to 4 Research, 3 to 12 hours. Prerequisite(s): upper-division standing and consent of instructor. Independent work under the direction of members of the staff. The project may be undertaken as a one-, two-, or three-quarter sequence. In the case of a two- or three-quarter sequence, the final grade may be deferred until completion of the last quarter. Course is repeatable to a maximum of 12 units.

Graduate Courses

POSC 201 Introduction to Political Inquiry 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to the logic of political inquiry. Problems of theory-building, research design, case selection, and measurement are covered in the context of quantitative and qualitative political research.

POSC 202A Survey of Quantitative Methods 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): POSC 201; graduate standing; and consent of instructor. An introduction to statistical analysis. Topics include descriptive statistics, probability, sampling distributions, parameter estimation, hypothesis testing, correlation, and bivariate regression analysis.

POSC 202B Survey of Quantitative Methods 4 Lecture, 3 hours; discussion, 1 hour; research, 3 hours. Prerequisite(s): POSC 201; graduate standing. Covers data analysis for political science applications. Topics include Statistical Package for the Social Sciences (SPSSX), regression analysis, causal modeling, factor analysis, and cluster analysis in research design context.

POSC 202C Theory and Methods of Causal Inference and Causal Analysis 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): POSC 202A, POSC 202B; or equivalent; graduate standing; or consent of instructor. Introduces modern techniques for causal inference in quantitative analysis. Topics include the potential outcome framework, causal graphs, regression discontinuity, DiD, matching methods, instrumental variables, causal bounds, and selection of covariates in regression analyses. Combines theory and practical applications with examples.

POSC 203 Social Science, History, and Qualitative Methodology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to the basic epistemology of qualitative social science. Provides students with a working knowledge of the strengths and weaknesses of the historical and comparative case study approaches to social science.

POSC 204 Mathematical Modeling in Political Science 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Survey of basic mathematical tools relevant to research in political science and other disciplines of the social sciences, with an emphasis on concepts and applications. Topics include sets, matrix algebra, comparative-static analysis, optimization problems, exponential and logarithmic functions, equality constraints in optimization, and integration.

POSC 205 Advanced Regression Analysis 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): POSC 202B. Introduction to the use of advanced techniques in regression analysis. Topics include model specification, measures of goodness of fit, two-stage least squares, and models with binary dependent variables.

POSC 207 Advanced Quantitative Analysis 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): POSC 202B; graduate standing. Introduction to the use of advanced techniques in quantitative analysis. Topics include maximum likelihood, sample selection bias, and simultaneous equations. Course is repeatable to a maximum of 8 units.

POSC 208 Seminar in Representation 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines representation in America. Topics include what it means to represent; the different means of representation; to what degree the elected behave consistently with constituents' preferences; and the accountability of elected officials. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

POSC 210 Qualitative Interpretive Research Methods 4 Seminar, 3 hours; individual study, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Covers interpretive methods used in social science research including interviews, ethnography, participant-observation, archival research, and case studies. Considers trade-offs involved in choosing one method or type of evidence over another. Provides practical experience with the major steps of interpretive research including project design and implementation, data analysis, writing, and publishing.

POSC 211 Comparative Historical Analysis 4 Seminar, 3 hours; individual study, 1.5 hours; written work, 1.5 hours. Prerequisite(s): POSC 203 with a grade of C- or better; graduate standing; or consent of instructor. Offers advanced training in methods of comparative historical analysis (CHA) in the social sciences. Topics include intellectual history of CHA, temporal analysis, path dependence, historical institutionalism, data collection, mixed-methods research, and publishing. Focuses on creating and critiquing research designs and undertaking major CHA projects. Assumes background in qualitative methodology. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

POSC 212 Political Theory 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A survey of general issues in political theory. Proponents covered may include Plato, Montesquieu, Weber, Arendt, Rawls, Foucault, and others. Debate models covered may include hermeneutics and normativity vs. science; power vs. truth; and democracy vs. liberalism. Course is repeatable to a maximum of 12 units.

POSC 213 Rhetoric and Argument in Ancient China and Greece 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A study of theories and practices of rhetoric, argument, persuasion, and, in some cases, poetics in ancient China and Greece (texts dating from the fifth to the third centuries B.C.), as well as some of their implications for contemporary theory and practice. Students who submit a seminar paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. This course may also be taken on a Satisfactory (S) or No Credit (NC) basis by students advanced to candidacy for the Ph.D. Cross-listed with CPLT 213.

POSC 214 Political Economy of International Trade 4 Lecture, 3 hours; individual study, 1 hour; research, 1 hour; written work, 1 hour. Prerequisite(s): POSC 216 recommended; graduate standing. Overview of the literature in International Political Economy IPE relevant to the study of trade and globalization. Introduces the relationship between international politics and the world economy. Evaluates theoretical debates relevant to trade politics including economic growth and development, gender, environmental protection, migration, trade in services and intellectual property protection. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

POSC 215 Political Economy of International Finance 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Conducts a broad theoretical and historical survey of the politics and economics of international money and finance. Topics include monetary

and exchange rate regimes, foreign direct investment, capital flows, sovereign debt, financial regulation and international macroeconomic coordination, the role of finance in economic development, and international financial crises. Cross-listed with ECON 236.

POSC 216 International Relations 4 Lecture, 3 hours. Prerequisite(s): consent of instructor. Historical development and present range of political thought on relations among nations, origins and implications of the idea of sovereignty, the theory of an international community, theories of imperialism. The analysis of selected contemporary problems--bipolarity, emergent nations, alliance systems in the light of recent contributions to international relations theory.

POSC 217 Comparative Politics 4 Lecture, 3 hours. Survey and introduction to comparative politics with emphasis on major ideas, trends, and issues in the field. Critical assessment of the literature on systems, political culture, development and underdevelopment, and elites.

POSC 218 Political Economy of International Migration 4 Lecture, 3 hours; individual study, 1 hour; research, 1 hour; written work, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Examines the political and economic causes and consequences of international migration. Explores the effects of migration in both sending and receiving countries and how policymakers respond to these effects. Focuses on public opinion formation, interest group politics, immigration policy making, brain drain, remittances, diaspora engagement policies, and refugee policy. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

POSC 220 Politics of Race, Immigration, and Ethnicity 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the politics of race, immigration, and ethnicity in the United States, including comparisons to ethnic politics in other regions of the world. Emphasizes the role of political institutions and processes in making race, immigration, and ethnicity more or less salient in elections, legislation, social movements, and interpersonal and intergroup relations. Course is repeatable to a maximum of 8 units.

POSC 225 Formal Analysis 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to the use of formal theory in political science. Covers the basics of game theoretical analysis and applications to substantive issues in the discipline. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 8 units.

POSC 227 Seminar in Religion and Politics 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A critical examination of the relationship between religion and politics from a comparative perspective. Studies politicization of religion in political issues such as secularism, gender rights, minority rights, terrorism, civil conflict, foreign policy, political Islam, and Christian democracy. May be taken Satisfactory(S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 8 units.

POSC 230 Research Colloquium in Political Science 1 Colloquium, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Provides professional development through training in full and effective engagement in scholarly inquiry and exchange. Utilizes tiered participation in student and faculty presentations. Discussion of current research in fields of political science: American politics, comparative politics, international relations, mass politics, and political theory. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 13 units.

POSC 249 American Politics 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Surveys major theoretical approaches to the study of American politics and enduring research questions in the field. Topics vary and could include the politics of race and ethnicity, the historical development of government institutions, political parties, voting behavior, federalism, and the policy-making process in the United States. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 16 units.

POSC 250 Seminar in Politics and the Legal Order 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Intensive reading and research on selected topics in politics and the legal order, such as law and social change, compliance with judicial decision making, and important areas of constitutional law.

POSC 252 Public Policy 4 Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores approaches to public policy analysis, emphasizing interaction between substance and process in policy development. Covers both theories and concrete case studies; special attention given to the administrative stage of policy development.

POSC 253 Mass Political Behavior 4 Seminar, 3 hours; research, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. A survey of general issues in mass political behavior. Topics may include political psychology, party identification, voting and other forms of participation, civic engagement, and political communication. Explores different methodological approaches to the study of mass political behavior. Course is repeatable to a maximum of 12 units.

POSC 254 Seminar On the United States Congress 4 Seminar, 3 hours. An examination of major research on the U.S. Congress. Emphasis will be placed upon substantive questions requiring further research and upon methodological techniques appropriate to such research.

POSC 255 Seminar in American Electoral Behavior 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the literature on electoral behavior in the United States. Focuses on the major models of voting behavior developed since 1945. In addition, issues such as voter turnout, economic voting, and presidential primaries are covered.

POSC 256 Seminar in Public Opinion and Mass Media 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores classic and contemporary research on public opinion and mass media. Topics in public opinion include political socialization, attitude constraint, and theories of attitude change. Topics in mass media include agenda setting and framing effects.

POSC 257 Comparative Political Behavior and Elections 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines issues in the theoretical literature on voting studies by using examples mainly from outside the U.S.

POSC 258 Congressional Elections 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Congressional elections is a growing field of inquiry in American electoral politics. Much scholarly debate has been generated over a variety of phenomena in this area. This seminar provides an overview of a number of these controversies and offers students the conceptual framework to critically analyze a rather large body of literature.

POSC 259 Women and the American Political Process 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An examination of the role of women in the American political process. Topics include the women's movement as a social movement and as an interest group, women as voters, candidates and office holders, and women's issues and the public policy process.

POSC 260 Economics and Elections 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the impact of issues and economic conditions on voting behavior in elections, with primary focus on United States presidential elections. The roles of campaigns and information are also covered.

POSC 261 American Political Institutions 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys the principal theoretical and empirical issues involved in the study of American political institutions. Covers the major U.S. national political institutions, including Congress, the presidency, the judiciary, the bureaucracy, interest groups, and political parties.

POSC 262 War Termination and Conflict Resolution 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Considers competing

explanations of why and when conflicts come to an end. Focuses on international and civil wars. Addresses questions such as the following: Why do civil wars last longer than international ones? Why are civil wars difficult to settle through negotiation? What impact does domestic politics have on international war termination?

POSC 263 Seminar On Conflict and Peace 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Considers some of the principal problems, issues, and findings in the study of the causes and consequences of war. Focuses on a number of key variables and their links to war under certain conditions and introduces students to standard data sources.

POSC 264 Seminar in International Political Economy 4 Seminar, 3 hours; consultation, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. An examination of major economic institutions, developments, and forces in world politics. Emphasizes contending theoretical approaches, issues in North-South relations, and consequences for regional and national political-economic development. Course is repeatable to a maximum of 12 units.

POSC 266 Political Economy of Growth 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): POSC 202A, POSC 202B; graduate standing; or consent of instructor. Examination of political and economic aspects of growth using a formal and quantitative approach. Topics include political institutions, social development, economic growth, and democratization. Emphasis is on the interaction and causality between political and economic variables.

POSC 267 Ethics and International Politics 4 Seminar, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): graduate standing; or consent of instructor. Examines ethical debates in the field of international politics. Topics include war theory, humanitarian aid, military intervention, international justice and human rights, aggression, peacekeeping, and global inequality. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

POSC 268 Human Rights 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; consent of instructor is required for students repeating the course. Surveys the primary theoretical and empirical issues in the study of human rights. Explores major themes and contemporary topics, including, but not limited to, cultural relativism, the evolution of the human rights regime, and the impact of globalization, domestic, and international institutions. Course is repeatable to a maximum of 8 units.

POSC 269 Political Economy of International Labor 4 Seminar, 3 hours; individual study, 1 hour; research, 1 hour; written work, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Conducts a broad overview of the international political economy of labor in both historical and contemporary context. Critically examines scholarly theories of labor in the context of capital mobility, global value chains, foreign direct investment, national and international institutions, international law, corporate governance, workers' movements, global unions, and labor transnationalism. Course is repeatable to a maximum of 12 units.

POSC 271 Comparative Political Economics 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Past attempts to address such questions as "What part does government play in the economy?" have been made within the disciplinary boundaries of political science or economics. Such questions, however, cut across the domains of economics and political science, and the new political economy attempts to integrate theories and insights from both disciplines. This course will examine this literature to see how successful it has been in explaining important aspects of the interrelationship between politicians and the economy.

POSC 272 Parties and Party Systems in Western Europe 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines some of the literature on parties and party systems in Western Europe, with special attention to the role of such systems in modern representative democracies and to debates in the literature on this topic.

POSC 273 Rational Choice in Comparative Politics 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The rational choice approach has begun to gain favor among a number of comparativists working on a variety of questions. This seminar critically reviews and discusses the contribution the rational choice perspective has made as well as the debates it has sparked.

POSC 274 The Armed Forces and Politics 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the role of the armed forces in political society, covering western-democratic, communist, postcommunist, and third world systems. Comparisons of civil-military relations across regions are made, with an emphasis on military political intervention and civilian control strategies.

POSC 275 New Books in Comparative Politics 4 Seminar, 3 hours; extra reading, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Critical examination of recently published books in comparative politics. Books covered vary each time course is offered. Topics include political behavior, identity and politics, democratization and democratic decline, and civil-military relations. Course is repeatable to a maximum of 8 units.

POSC 276 Democracy and Democratization 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Addresses topics and readings on democracy and democratization within the field of comparative politics. Covers arguments between democracy and democratization across regions and time. Explores the relative impact of economic, social, and political factors in the emergence of democracy and conditions sustained therein.

POSC 277 African Politics Seminar 4 Seminar, 3 hours; individual study, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Critical examination of the dominant questions, theories, and empirical research in the study of politics and power in Africa. Topics include historical legacies and disruptions, identity politics (gender, race, ethnicity), distributive politics, political behavior, and institutions.

POSC 278 Seminar in Latin American Politics 4 Seminar, 3 hours; extra reading, 1.5 hours; research, 1.5 hours. Prerequisite(s): graduate standing; or consent of instructor. A critical examination of fundamental issues of Latin American politics. Focuses on varying interpretations and approaches to the study of elites and masses, power and class conflict, and development and underdevelopment. Course is repeatable to a maximum of 8 units.

POSC 279 Asian Political Economy in Comparative Perspective 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the political economy of late development, particularly in East Asia, including rival forms of institutional analysis, case studies versus comparative analysis, and the particular data and methodological challenges of fieldwork-based analysis.

POSC 280 Seminar in Political Theory 4 Seminar, 3 hours; extra reading, 2 hours; research, 1 hour. Prerequisite(s): graduate standing; and consent of instructor. A detailed study at an advanced level of political theories and concepts and the writings of their major theorists. Themes and eras covered vary each quarter. Course is repeatable to a maximum of 12 units.

POSC 281 Seminar in the History of Political Thought 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced study of the methodology and practice of research in the history of political thought. Course is repeatable to a maximum of 12 units.

POSC 282 Political Theory and Policy Analysis 4 Seminar, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): graduate standing or consent of instructor. Provides an overview of the literature focusing on the analysis of individual behavior within various types of institutional arrangements. Introduces a diversity of work oriented in rational choice theory, broadly defined. Emphasis is placed on applying institutional analysis to legislative, bureaucratic, and so-called informal institutions.

POSC 283 Political Thinkers in Depth 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent

of instructor. Explores in depth one or more great political thinkers from around the world. Focuses on methodologies of research and interpretation. May include works by Plato, Confucius, Machiavelli, Marx and Engels, John Stuart Mill, or Gandhi. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 12 units.

POSC 285 Professional Research Paper 4 Research, 12 hours. Prerequisite(s): graduate standing or consent of instructor. An independent study course focusing on writing a substantial research paper, emphasizing research design problems. Must be accomplished within two quarters following doctoral qualifying examinations. Course is repeatable.

POSC 290 Directed Studies 1 to 6 Research, 3 to 18 variable hour. Prerequisite(s): graduate standing; consent of instructor. Advanced work in a topic or topics appropriate to the student's special interests and needs. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

POSC 291 Individual Study in Coordinated Areas 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing; and consent of instructor. A program of study designed to advise and assist candidates who are preparing for doctoral examinations. Does not count toward the unit requirement for the master's degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

POSC 292 Concurrent Analytical Studies in Political Science 2 to 4 Research, 8 to 16 hours. Prerequisite(s): graduate standing; and consent of instructor. Taken concurrently with a 100-series course on an individual basis. Includes a graduate-level paper based on research or criticism related to the 100-series course. POSC 114, POSC 142(E-Z), POSC 186, POSC 190, and POSC 196A through POSC 199 may not be used. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

POSC 293 Research Topics in Political Science 1 Lecture, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Lectures and discussions by invited scholars and faculty on selected research topics in political science. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

POSC 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing or consent of instructor. Individual research performed under the direction of a faculty advisor. Designed for students preparing their dissertation prospectuses. Students meet in groups by appointment with a faculty advisor to discuss issues of dissertation writing. Emphasis is placed on the development of research design. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

POSC 299 Research For Thesis Or Dissertation 1 to 12 Thesis 3 to 36 hours. Prerequisite(s): graduate standing or consent of instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

POSC 301 Teaching of Political Science at the College Level 2 Seminar, 1 hour; practicum, 3 hours. Prerequisite(s): graduate standing in Political Science. A program of weekly meetings and individual formative evaluation required of new Political Science Teaching Assistants. Covers instructional methods and classroom/section activities most suitable for teaching Political Science. Conducted by departmental faculty or the Teaching Assistant Development Program. Graded Satisfactory (S) or No Credit (NC).

POSC 302 College Teaching Practicum 1 to 4 Practicum, 2 to 8 hours; consultation, 1 to 4 hours. Prerequisite(s): graduate standing and consent of instructor. Required of all teaching assistants in the department. Credit not applicable to graduate unit requirements. Supervised teaching in college level classes under the supervision of the course instructor. Graded Satisfactory (S) or No Credit (NC).

Population Biology

College of Natural and Agricultural Sciences

The interdepartmental Ph.D. program in Population Biology is not currently accepting new students. For further information call (800) 735-0717 or (951) 827-5621.

Psychology

Subject abbreviation: PSYC
College of Humanities, Arts, and Social Sciences

Tuppett M. Yates, Ph.D., Chair
Department Office, 1111 Psychology Building; (951) 827-4991

Undergraduate Advising Office
1200 Psychology
(951) 827-5386; psych.ucr.edu

Professors

Gene Brewer, Ph.D.
Elizabeth Davis, Ph.D.
David Funder, Ph.D. *Distinguished Professor of Graduate Division*
Kelly Huffman, Ph.D.
Sonja Lyubomirsky, Ph.D. *Distinguished Professor*
Carolyn Murray, Ph.D. *Professor of Graduate Division*
Misaki Natsuaki, Ph.D.
Khaleel A. Razak, Ph.D.
Rebekah Richert, Ph.D.
David Rosenbaum, Ph.D. *Distinguished Professor*
Katharine Sweeny, Ph.D.
Tuppett Yates, Ph.D.
Weiwei Zhang, Ph.D.
Kim Wilcox, Ph.D. *Chancellor*

Professors Emeriti

John Andersen, Ph.D.
Curt Burgess, Ph.D.
Christine Chiarello, Ph.D.
Steven Clark, Ph.D.
Howard Friedman, Ph.D.
Mary Gauvain, Ph.D.
Daniel Ozer, Ph.D.
Chandra Reynolds, Ph.D.
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Jimmy Calanchini, Ph.D.
Cecilia Cheung, Ph.D.
John Franchak, Ph.D.
Peter Hickmott, Ph.D.
Brent Hughes, Ph.D.
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Aerika Loyd, Ph.D.
Kalina Michalska, Ph.D.
Megan Robbins, Ph.D.
Thomas Sy, Ph.D.
Rachel Wu, Ph.D.

Assistant Professors

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Ian Ballard, Ph.D.
Diamond Bravo, Ph.D.
Halle Dimsdale-Zucker, Ph.D.
Anubhuti Goel, Ph.D.
Tabea Springstein, Ph.D.
Deepa Ramamurthy, Ph.D.
Bernardette Pinetta, Ph.D.
Na Yeon, Kim, Ph.D.
Kiera Coulter, Ph.D.

Associate Professor of Teaching

Annie Ditta, Ph.D.

Assistant Professor of Teaching

Hayden Hendley, Ph.D.

Majors and Career Opportunities

The major in Psychology is designed to give students a broad, general exposure to knowledge in the various areas of psychology and to the methods psychologists use to conduct research. The B.A. degree in Psychology is useful to those students seeking careers in probation and parole, corrections, personnel, industrial relations, mental health work, social work, or positions as trainees in a variety of executive training programs. The degree also prepares students for graduate school in psychology in either M.A. or Ph.D. programs. Such graduate programs prepare students for a variety of career possibilities. Careers include teaching and research positions in community and private colleges and state and other universities as well as career positions such as research psychologist, clinical psychologist, counseling psychologist, and industrial psychologist. For more information, see psych.ucr.edu.

The department offers a minor in Psychology and a major in Psychology/Law and Society.

Transfer Students

Transfer applicants must have a minimum GPA of 2.70. Applicants must also have a minimum of one UC transferable mathematics course equivalent to Math 004 or higher.

Change of Major Criteria

Students switching to the Psychology or Psychology/Law and Society must have completed the following courses with grades of C- or better and have been in good academic standing for two quarters or more.

1. **Lower Division requirements**

   a. PSYC 001, PSYC 002, PSYC 011 and MATH 004 or higher

Transfer students and others entering the major after achieving sophomore standing must complete the requirements within one year by enrolling in applicable courses every quarter until the requirement is met. Students who do not complete the lower-division requirements in this timely fashion and with at least the minimum required grade average will not be permitted to continue in the Psychology major. Students must check course descriptions for prerequisite requirements.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

The lower-division biological, physical sciences, and mathematics requirements for the Psychology major also count toward the college's Natural Sciences and Mathematics breadth requirement. Consult with a departmental advisor.

Major Requirements

Psychology Major

Psychology offers B.A. and B.S. degrees. The Psychology major requires completion of the lower-division requirements listed below by the end of the sophomore year, with an average grade of "C" or better with no grade below a "C-", before upper-division Psychology courses are taken. All courses must be taken for a letter grade.

For the Bachelor of Arts

The major requirements for the B.A. degree in Psychology are as follows:

1. **Lower-division requirements (at least 39 units)**
   a) One course in Mathematics equivalent to MATH 004 or higher; or a score on the MAE (Math Advisory Exam) sufficient for placement into MATH 022 or higher.
   b) One 4 unit course in Biological Sciences (Biochemistry, Biology, Botany and Plant Sciences, Entomology, Nematology, or Plant Pathology)
   c) One 4 unit course in Physical Sciences (Chemistry, Physics, Earth Sciences, excluding cultural Geography courses)
   d) Two additional 4 unit courses that satisfy the CHASS Natural Sciences and Mathematics breadth requirements.
   e) PSYC 001, PSYC 002, PSYC 011, PSYC 012
2. **Upper-division requirements (37 units)**
   a) PSYC 110 or CBNS 106
   b) PSYC 140, PSYC 150
   c) PSYC 132 or PSYC 134
   d) PSYC 160 or PSYC 161 or PSYC 162 or PSYC 163
   e) Four additional 4-unit, upper-division Psychology courses, with the following restrictions: only one quarter of PSYC 190 (for a total of 4 units, letter grade required); only one quarter of PSYC 195 (for a total of 4 units, letter grade required); only one quarter of PSYC 197 (for a total of 4 units, letter grade required), only one quarter of PSYC 195H (for a total of 4 units, letter grade required); only one quarter of PSYC 199 (for a total of 4 units, letter grade required); only one quarter of PSYC 199H (for a total of 4 units, letter grade required); only one quarter of PSYC 198G, or one 4-to 8-unit quarter of PSYC 198I may be included

Students planning for graduate school should take into consideration any specific graduate school requirements when choosing these elective Psychology courses.

Note: Students who have taken general or introductory Psychology courses other than PSYC 001 and PSYC 002 must consult with a departmental advisor.

For the Bachelor of Science

The B.S. degree is designed to provide a research-intensive curriculum for students who want a deeper understanding of how knowledge is created through research and for students who may be interested in research-based graduate programs in psychology and the biological sciences.

Psychology courses must be taken for a letter grade. Students must check course descriptions for prerequisite requirements.

Admission

A limited number of students are accepted into the B.S. degree of the Psychology major. Acceptance is according to overall GPA and acceptable progress towards the Psychology major, including PSYC 001, PSYC 002, PSYC 011 and PSYC 012 with a B- or better. Students must apply when they have completed between 75 and 100 quarter units of college work.

The major requirements for the B.S. degree in Psychology are as follows:

1. **Lower-division requirements for the B.S. (at least 39 units)**
   a) One course in Mathematics equivalent to MATH 004 or higher; or a score on the MAE (Math Advisory Exam) sufficient for placement into MATH 022 or higher.
   b) One 4 unit course in Biological Sciences (Biochemistry, Biology, Botany and Plant Sciences, Entomology, Nematology, or Plant Pathology)
   c) One 4 unit course in Physical Sciences (Chemistry, Physics, Earth Sciences, excluding cultural Geography courses)
   d) Two additional 4 unit courses that satisfy the CHASS Natural Sciences and Mathematics breadth requirements.
   e) PSYC 001, PSYC 002, PSYC 011, PSYC 012 with no grade below a B-
2. **Upper-division requirements (37 units)**
   a) PSYC 110 or CBNS 106
   b) PSYC 140, PSYC 150
   c) PSYC 132 or PSYC 134
   d) PSYC 160 or PSYC 161 or PSYC 162 or PSYC 163
   e) Any three of the following: PSYC 109, PSYC 120L/CBNS 120L, PSYC 122L, PSYC 123L/CBNS 130L, PSYC 180, PSYC 181, PSYC 182 (E- Z), PSYC 195, PSYC 197 (for a total of 4 units, letter grade required), PSYC 199H. Also 195/197 can be applied twice (4 units and letter grade repeatable for up to 8 units).
   f) One of the following: PSYC 117, PSYC 136, PSYC 139, PSYC 148, PSYC 169, or PSYC 190 (for a total of 4 units, letter grade required).One of the following graduate seminars may be substituted, with permission of the instructor: PSYC 251, PSYC 255, PSYC 256, PSYC 257, PSYC 258, PSYC 263
   g) One additional 4-unit, upper-division Psychology course, with the following restrictions: only one quarter of PSYC 190 (for a total of 4 units, letter grade required); only one quarter of PSYC 195 (for a total of 4 units, letter grade required); only one quarter of PSYC 197 (for a total of 4 units, letter grade required), only one quarter of PSYC 195H (for a total of 4 units, letter grade required); only one quarter of PSYC 199 (for a total of 4 units, letter grade required); only one quarter of PSYC 199H (for a total of 4 units, letter grade required); only one quarter of PSYC 198G, or one 4-to 8-unit quarter of PSYC 198I may be included

Students planning for graduate school should take into consideration any specific graduate school requirements when choosing these elective Psychology courses.

Psychology/Law and Society Major

The Law and Society major is open to undergraduate students with junior standing who have completed LWSO 100 with a grade of "C" or higher.

All requirements for the B.A. in Psychology (39 lower-division units, which includes 16 units that are also used for college breadth requirements; 37 upper-division units)

1. **Lower-division requirements (at least 39 units)**
   a) One course in Mathematics equivalent to MATH 004 or higher; or a score on the MAE (Math Advisory Exam) sufficient for placement into MATH 022 or higher.
   b) One 4 unit course in Biological Sciences (Biochemistry, Biology, Botany and Plant Sciences, Entomology, Nematology, or Plant Pathology)
   c) One 4 unit course in Physical Sciences (Chemistry, Physics, Earth Sciences, excluding cultural Geography courses)
   d) Two additional 4 unit courses that satisfy the CHASS Natural Sciences and Mathematics breadth requirements.
   e) PSYC 001, PSYC 002, PSYC 011, PSYC 012
2. **Upper-division requirements (37 units)**
   a) PSYC 110 or CBNS 106
   b) PSYC 140, PSYC 150

c) PSYC 132 or PSYC 134

d) PSYC 160 or PSYC 161 or PSYC 162 or PSYC 163

e) Four additional 4-unit, upper-division Psychology courses, with the following restrictions: only one quarter of PSYC 190 (for a total of 4 units, letter grade required); only one quarter of PSYC 195 (for a total of 4 units, letter grade required); only one quarter of PSYC 197 (for a total of 4 units, letter grade required), only one quarter of PSYC 195H (for a total of 4 units, letter grade required); only one quarter of PSYC 199 (for a total of 4 units, letter grade required); only one quarter of PSYC 199H (for a total of 4 units, letter grade required); only one quarter of PSYC 198G, or one 4-to 8-unit quarter of PSYC 198I may be included

3. **Requirements for Law and Society (36 units)**

a) PHIL 007 or PHIL 007H

b) LWSO 100 (with a grade of "C" or better)

c) One course chosen from POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)

d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159

e) Two courses chosen from HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180

f) LWSO 193, Senior Seminar

Note: For sections 3.d) and 3.e) combined, not more than two courses may be taken from the same department. In fulfilling requirements of two or more majors, students may not count more than two courses toward both parts of their total requirements. For this major, PSYC 012 fulfills a requirement in both Psychology and Law and Society.

Minor

Prerequisites for the minor in Psychology are PSYC 001, PSYC 002, PSYC 011, and PSYC 012, with an average grade of "C" or better, with no grade below a "C-".

Requirements for the Psychology minor are as follows (21 units):

1. Twenty-one (21) upper-division Psychology units

a) PSYC 110 or CBNS 106

b) PSYC 132 or PSYC 134

c) PSYC 140 and PSYC 150

d) PSYC 160 or PSYC 161 or PSYC 162 or PSYC 163

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Graduate Program

The Department of Psychology offers the M.A. and Ph.D. degrees in Psychology; however, applications are not accepted from students wishing to work towards the master's degree only.

Graduate training in Psychology is offered in four major areas: Cognition and Cognitive Neuroscience, Social/Personality, Developmental, and Behavioral Neuroscience.

Admission

Students are normally expected to have completed the equivalent of an undergraduate major in Psychology at the UC, with background preparation in basic science and mathematics.

The Ph.D. degree is a research degree. Students must demonstrate the ability to complete rigorous empirical research and must be active in research throughout their graduate career. The course requirements in the Ph.D. program are directed toward establishing a foundation for critical evaluation of research literature and designing conceptually important empirical research.

Doctoral Degree

Course Work The courses normally required during the first two years include the following:

1. **PSYC 211; PSYC 212; and PSYC 213, 214 or 215**
(Behavioral Neuroscience students take two of the three, as directed by the student's advisor.)
2. **The appropriate area core:**

Cognition and Cognitive Neuroscience: Any combination of three courses chosen from PSYC203A, PSYC 203B, or PSYC 203C; and PSYC 233

Developmental: PSYC 207A, PSYC 207B, PSYC 207C, PSYC 208

Social/Personality: PSYC 225, PSYC 226, PSYC 227

Behavioral Neuroscience: NRSC 200A/PSYC 200A, NRSC 200B/PSYC 200B, NRSC 200C/PSYC 200C

3. **Five additional courses or seminars selected to provide further study beyond the area core course requirements.** Courses or seminars must be 3- or 4-units, and at least one must be a Departmental core course (listed in 2, above) outside the student's area of specialization. The student's adviser and the department graduate adviser must approve the list of courses used to satisfy this further study requirement. Students who have completed graduate-level course work prior to entering the UCR program may request that specific courses be accepted toward the satisfaction of this requirement. This request will be reviewed using procedures and standards typically applied to the approval of courses to satisfy this requirement.
4. **PSYC 301:** Required of all graduate students prior to or concurrent with the first teaching assistant appointment unless waived by petition due to previous experience.

The Psychology Department requires that each student earn a "B" average in the PSYC 211, PSYC 212, and PSYC 213, PSYC 214, or PSYC 215 sequence and in the student's area core courses, with no grade lower than a "B-".

In addition, students must be enrolled in the appropriate area of Proseminar every quarter until advancement to candidacy:

Cognition and Cognitive Neuroscience: PSYC 283

Developmental: PSYC 284

Social/Personality: PSYC 285

Behavioral Neuroscience: PSYC 287 or PSYC 289

Progress in the program is formally evaluated in June of each year and informally on a continuing basis by noting participation in class and in research.

All students in the graduate program are held to these requirements whether or not they have taken graduate work at, or hold an M.A. from, another institution. The only exception may be for previously-taken graduate-level course work which is thought to be equivalent to one or more of PSYC 211, PSYC 212, or PSYC 213, or PSYC 214, or PSYC 215. If a grade of "B" or better was received, and with the approval of the advisor, the student may be tested by a departmental instructor of the course(s) in question. On the basis of the results of the test, the instructor decides if the course can be waived.

Professional Development Requirement

The Professional Development course (PSYC 409B) curriculum satisfies the Professional Development requirement. Topics discussed typically include: interviewing, writing, and oral presentation skills; the academic job market and the job application process; and nonacademic careers. Other professional development courses may be used to satisfy this requirement if approved by the graduate advisor.

Second-Year Research Project

All students are required to begin research in their first year in the graduate program, under the supervision of a three-person committee. The committee is to be chaired by the student's advisor; the student and advisor will then select two others, at least one of whom must be from the student's major area. The second-year research project culminates in a paper and an oral presentation, with the oral presentation serving as the oral comprehensive exam for students opting for the mater's degree (see below). The second-year research project must be completed prior to taking any portion of the qualifying examinations. Students in the social/personality and developmental major areas are required to complete the written paper of the second-year research project on or before April 15th of their second year; all other students must complete the paper prior to their oral exam. No later than June of the second year in the program, all students must make an oral presentation of

the results of the second-year research project at a meeting of the major area faculty and fellow students (typically in the area proseminar). Committee members must synchronously attend the full presentation and question period. Unanimous agreement among the committee members is required for the student to pass both the written and the oral portions of the second-year research project (a single no vote constitutes a fail).

If a student's committee determines that the student failed the second-year research project (either written or oral portion), the student will have the opportunity to rewrite the paper and/or redo the oral presentation one time. Students must complete the rewrite/redo within six months. If the second attempt is not successful, the Department will recommend to the Dean of the Graduate Division that the student be dismissed from the program.

Master's Degree
Although there is not a separate terminal master's program, students may apply for the master's degree at the beginning of the quarter in which they expect to complete the statistical sequence, the appropriate area core, two of the five further study courses, PSYC 301 (see 1, 2, 3, and 4 above), and a minimum of 36 units in graduate status (of which at least 18 must be in graduate course work) and pass an oral comprehensive examination administered by the Psychology Department.

Teaching Experience
Each student must gain experience in a teaching capacity for the equivalent of at least three full quarters. Teaching assistants assist a faculty member in an undergraduate course by preparing and grading examinations, reading papers, lecturing, and conducting discussion and laboratory sections.

Written and Oral Qualifying Examinations
The qualifying examination should be taken during the third year of full-time graduate study. It consists of a written component and an oral examination, and focuses on the subject matter in the student's chosen area of concentration.

A qualifying committee should be nominated early in the third year, and all core and breadth requirements must be completed no later than the quarter in which the qualifying examination is taken.

The Oral Qualifying Exam can be taken in one of the following modes: In-Person, Hybrid, or Remote. The student and their committee chair will discuss which mode best suits the subject matter, with the committee chair making the final determination. Students taking the exam In- Person are expected to present the exam on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the exam on campus in a video-enabled room that supports one or more committee members being physically present and others remote. A remote exam involves all committee members and the student participating via videoconferencing software (e.g., Zoom) with no expectation for physical presence on campus of any meeting participant.

Committee members nominated from outside the UC Academic Senate who participate remotely must have qualifications comparable to a UC Academic Senate member and submit a letter of intention and CV. In addition, strong academic justification for inclusion on the committee must be provided by the Graduate Advisor.

On the basis of this examination (and completion of the core and breadth requirements), the student may pass and be advanced to candidacy for the Ph.D.; fail, and be permitted one retake; be awarded the M.A. (if not previously awarded) but not be advanced to candidacy for the Ph.D.; or not be awarded the M.A. and not be advanced to candidacy for the Ph.D.

Upon successful completion of 1, 2, 3, and 4, passing the qualifying examination, and nomination of the dissertation committee, the Graduate Division sends the student an application for advancement to candidacy.

Dissertation and Final Oral Examination:
Students must complete a dissertation on a subject chosen by the candidate, bearing on the principal area of concentration and showing the student's ability in independent investigation. The dissertation committee guides the student in preparing the dissertation and examines the student during the defense of the dissertation.

The Final Dissertation Defense can be completed in one of the following modes: In-Person, Hybrid, or Remote. The student and their committee chair will discuss which mode best suits the subject matter, with the committee chair making the final determination. Students completing the defense in-person are expected to present the Final Defense on campus with all committee members physically present. If Hybrid is chosen, the student is expected to present the Final Defense on campus in a video-enabled room that supports one or more committee members being physically present and others remote. A remote defense involves all committee members and the student participating via videoconferencing software (e.g., Zoom) with no expectation for physical presence on campus of any meeting participant.

Committee members nominated from outside the UC Academic Senate who participate remotely must have qualifications comparable to a UC Academic Senate member and submit a letter of intention and CV. In addition, strong academic justification for inclusion on the committee must be provided by the Graduate Advisor.

Each of the four major areas may have additional requirements. Occasionally, a change in courses used to satisfy specific requirements may be justifiable. For a complete description of the program, visit psych.ucr.edu.

Normative Time to Degree 15 quarters

Optional Specialized Subfield of Study

In addition to pursuing a doctoral degree in one of the core areas of psychology, graduate students may qualify, under the direction of the committee in charge of the relevant Specialized Subfield of Study, for any one or more of three subfields of study: Quantitative Psychology, Health & Well-Being Psychology, and Diversity & Inequality Psychology. Students wishing to pursue a Specialized Subfield of Study should typically pursue one or at most two subfields, as their training interests dictate. Exceptional requests to pursue more than two subfields may be granted by the Graduate Advisor in consultation with the relevant subfield committees and the student's primary advisor. Each Specialized Subfield of Study has the following requirements:

1. Submission of a letter of interest to the chair of the relevant specialized subfield committee, in which the student should articulate their interest in the specialization with regard to its relevance for the student's course of graduate study and the student's longer-term career plans.
2. Enrollment and satisfactory completion of at least three quarters of the relevant proseminar.
3. Satisfactory completion of at least three courses relevant to the relevant Specialized Subfield of Study topic, as approved by the relevant subfield of study committee. No more than two courses used to satisfy a Specialized Subfield of Study requirement may be used to fulfill the general further studies requirement for doctoral study in psychology, and no more than two courses may be used to satisfy the requirements of multiple Specialized Subfields of Study (i.e., at least one course for each subfield must be uniquely applied to that subfield's requirements). The qualifying courses vary from subfield to subfield. However, no core course (i.e., PSYC 200A/B/C, 203A/B/C, 207A/B/C, 208, 225, 226, or 227) may count toward a subfield's requirements. Statistical and methods courses (e.g., 233, 259) are typically not appropriate for these requirements except in the case of the Quantitative Psychology Subfield. Exceptions may be granted by the Graduate Advisor in consultation with the relevant subfield committee and the student's advisor.
4. Successful completion of an oral examination based upon a project completed by the student on a topic relevant to the subfield of study. A three-person faculty committee, approved by the chair of the committee in charge of the relevant subfield of study. must grant prior approval of the topic of the project and conduct the oral examination. No more than two members can overlap between subfield committees for a given student (i.e., at least one member of the evaluating committee must be unique to each Specialized Subfield of Study). The student and the committee dete1mine the format of the oral exam; a presentation in the relevant pro-seminar based on the project satisfies the oral examination requirement.
5. Submission of a form to the relevant subfield of study committee confirming completion of all requirements.

Subfield of Study-specific requirements:

Quantitative Psychology: Further requires completion of PSYC 211; PSYC 212; and PSYC 213 or

214, with a grade of"A-" or better in each course, or passing an examination covering the three courses. The relevant proseminar is PSYC 270.

Health & Well-Being Psychology: Further requires submission of a written paper on the completed project, due to the faculty committee prior to the oral examination. The relevant proseminar is PSYC 286E.

Diversity & Inequality Psychology: Further requires submission of a written paper on the completed project, due to the faculty committee prior to the oral examination. The relevant proseminar is PSYC 286F.

Opportunities for Graduate Study in Neuroscience

Faculty from the Department of Psychology participate in a unique graduate specialization in Neuroscience which draws on the strengths of distinguished scientists from several units. For further information concerning work in this area, see Neuroscience Graduate Program in the Programs and Courses section of this catalog.

Lower-Division Courses

PSYC 001 Introductory Psychology 4 Lecture, 3 hours; discussion, 1 hour. An introduction to psychology as an experimental science. Emphasizes topics in cognitive (including learning, memory, sensation, perception), comparative, and physiological psychology.

PSYC 002 Introductory Psychology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Emphasizes topics in developmental psychology, tests and measurements, social psychology, personality, and abnormal behavior.

PSYC 011 Psychological Methods: Statistical Procedures 5 Lecture, 3 hours; discussion, 2 hours. Prerequisite(s): MATH 004 with a grade of C- or better or MATH 005A with a grade of C- or better or MATH 006A with a grade of C- or better or MATH 006B with a grade of C- or better or MATH 007A with a grade of C- or better or MATH 007B with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 09HA with a grade of B or better or MATH 009B with a grade of C- or better or MATH 09HB with a grade of B or better or MATH 009C with a grade of C- or better or MATH 09HC with a grade of B or better or MATH 010A with a grade of C- or better or MATH 010B with a grade of C- or better or MATH 022 with a grade of C- or better; PSYC 001 with a grade of C- or better; PSYC 002 with a grade of C- or better; or a score on the Math Advisory Exam sufficient for placement into MATH 005A or MATH 022 or higher. Covers descriptive and inferential statistics, measures of central tendency, variability, and correlation. Introduces sampling distributions, statistical inference, and hypothesis testing.

PSYC 012 Psychological Methods: Research Procedures 6 Lecture, 3 hours; laboratory, 3 hours; research, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): ENGL 001B with a grade of C or better; PSYC 001 with a grade of C- or better; PSYC 002 with a grade of C- or better; PSYC 011 with a grade of C- or better; MATH 004 with a grade of C- or better or MATH 005A with a grade of C- or better or MATH 006A with a grade of C- or better or MATH 006B with a grade of C- or better or MATH 007A with a grade of C- or better or MATH 007B with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 09HA with a grade of B or better or MATH 009B with a grade of C- or better or MATH 09HB with a grade of B or better or MATH 009C with a grade of C- or better or MATH 09HC with a grade of B or better or MATH 010A with a grade of C- or better or MATH 010B with a grade of C- or better or MATH 022 with a grade of C- or better; or equivalent; a score on the Math Advisory Exam sufficient for placement into MATH 005A or MATH 022 or higher; consent of instructor is required for students repeating the course. A systematic survey of research methodologies in psychology. Laboratory assignments include evaluating and testing psychological theories; assessing methodologies and research designs; designing and implementing research; collecting data and analyzing statistics; writing research reports; and discussing ethical issues in science.

PSYC 013 Skepticism and Pseudoscience in Psychology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): WRIT 010 with a grade of C or better or WRIT 010S with a grade of C or better or WRIT 009 with a grade of C or better; or consent of instructor. Studies topics at the borderland of psychology (extra-sensory perception, repressed memory, pseudoscientific beliefs, parapsychology, psychic phenomena, faith healing, and mass hysteria). Explores skepticism, cynicism, and "gullibility," and the rhetoric of extraordinary claims. Stresses the development of scientific literacy, critical thinking skills, hypothesis testing, and understanding psychology as an empirical science.

PSYC 049 Topics in Psychology 4 Lecture, 3 hours; discussion, 1 hour. Explores a topic of general interest in psychology. Debate and dialog are the distinguishing features of this course. Topics are announced in the Schedule of Classes. Course is repeatable as content or topic changes to a maximum of 16 units.

PSYC 096 Research For Lower-Division Students 1 to 2 Research, 3 to 6 hours. Prerequisite(s): restricted to class level standing of freshman, or sophomore; and consent of instructor. An introduction to research in psychology. Emphasizes aspects of library and laboratory research within the content of ongoing faculty research programs Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units. Credit is awarded for one of the following PSYC 096 or PSYC 096L.

PSYC 096L Research Laboratory For Lower-Division Students 1 to 2 Laboratory, 3 to 6 hours. Prerequisite(s): restricted to class level standing of freshman, or sophomore; and consent of instructor. An introduction to research in psychology. Emphasizes aspects of library and laboratory research within the content of ongoing faculty research programs. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units. Credit is awarded for one of the following PSYC 096L or PSYC 096.

Upper-Division Courses

PSYC 109 Advanced Research Methods 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, each with a grade of "B-" or better; or equivalents; or consent of instructor. Advanced theory and practice of planning, conducting, reporting, and evaluating research in the social and behavioral sciences. Students conduct original research that, if desired, can lead to (and become part of) a senior honors thesis or other senior-level research project. Satisfactory (S) or No Credit (NC) grading is not available.

PSYC 110 The Brain and Behavior 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001 with a grade of "C-" or better, or equivalents, or consent of instructor. Explores the principles of neuroanatomy and neurophysiology and their relationship to brain function. Topics include sensory and perceptual processes, biological aspects of learning and memory, motivation, emotion, language, and abnormal behavior.

PSYC 112 Neural Mechanisms of Animal Behavior 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 with a grade of "C-" or better or PSYC 110 with a grade of "C-" or better or consent of instructor. Studies how the nervous systems of vertebrates and invertebrates contribute to and control their behavior. Focuses on aspects of sensory physiology with a brief orientation to the structure and function of nervous systems. Emphasizes a top-down approach to neurobiology, with specific behaviors providing guidelines for an examination of neural mechanisms.

PSYC 113 Pandemic Biopsychology: From Virus to Vaccine 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001 with a grade of C- or better, PSYC 002 with a grade of C- or better, PSYC 011 with a grade of C- or better, PSYC 012 with a grade of C- or better; or consent of instructor. Explores pandemics through analyses of historical events, scientific research investigating viruses related to global outbreaks, human immune response to infection, and how different vaccines (adenovirus, mRNA) are created and function in human systems. Also examines how pandemics impact people's sense of security, mental health, and personal well-being.

PSYC 115 Drugs and Behavior 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 with a grade of "C-" or better or PSYC 110 with a grade of "C-" or better or consent of instructor. Describes both legal and illegal drugs. Analyzes drug-nervous system interactions and how the use of various drugs (particularly drugs of abuse) affects behavior and psychological well-being.

PSYC 117 Cognitive Neuroscience of Memory and Consciousness 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): CBNS 106 with a grade of "C-" or better or PSYC

110 with a grade of "C-" or better. Surveys the neural basis of mental processes, focusing on memory and consciousness and their behavioral manifestations. Emphasizes current research literature.

PSYC 120 Cellular Neuroscience: Membrane and Synaptic Phenomena 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or consent of instructor. An examination of cellular and molecular mechanisms of nervous system function using concepts drawn from the study of vertebrates and invertebrates with emphasis on mammalian systems. Cross-listed with CBNS 120.

PSYC 120L Neuroscience Laboratory 4 Lecture, 1 hour; discussion, 1 hour; laboratory, 3 hours; written work, 3 hours. Prerequisite(s): CBNS 120, may be taken concurrently or PSYC 120, may be taken concurrently; or consent of instructor. Laboratory experiments using electrophysiological, chemical, and anatomical research methods fundamental to understanding neurons and neural systems. Cross-listed with CBNS 120L.

PSYC 121 Developmental Neuroscience 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or consent of instructor. A study of the development of nervous systems. Examines the cellular and molecular mechanisms of neural development and the determinants of cell birth and death, axonal pathfinding, neuronal connections, and development of neural systems underlying behavior. Cross-listed with CBNS 121.

PSYC 122 Human Neuroimaging 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 110 or CBNS 106 or consent of instructor. PSYC 122 can be taken without PSYC 122L. An introduction to magnetic resonance imaging in psychological research with an emphasis on the merits and limitations of structural and functional neuroimaging in humans.

PSYC 122L Human Neuroimaging Laboratory 4 Lecture, 1 hour; laboratory, 3 hours; extra reading, 3 hours; written work, 3 hours. Prerequisite(s): PSYC 122, may be taken concurrently, PSYC 110 or CBNS 106; or consent of instructor. Laboratory exercises in the design, acquisition, and analysis of structural and functional magnetic resonance imaging data.

PSYC 123L Computational Neurophysiology Laboratory: Simulating Neuronal Membrane Properties 4 Lecture, 1 hour; discussion, 1 hour; laboratory, 3 hours; written work, 3 hours. Prerequisite(s): CBNS 106; CBNS 120, may be taken concurrently or PSYC 120, may be taken concurrently; and consent of instructor. Introduces computer modeling techniques to enhance understanding of neuronal membrane physiology. Selected topics include biophysical models of single neurons including passive properties and action potential firing, channels regulating neuronal firing properties, synaptic interactions, and simple circuits. Cross-listed with CBNS 130L.

PSYC 124 Systems Neuroscience 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 with a grade of C- or better; or consent of instructor. A study of the structure and function of motor and sensory systems in vertebrate and invertebrate nervous systems. Cross-listed with CBNS 124.

PSYC 125 Neuropharmacology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 120/PSYC 120. Examines synaptic neurotransmitter systems, mechanisms, and pharmacological agents and effects, which are fundamental to neural information processing. Cross-listed with CBNS 125.

PSYC 126 Neuroscience of Learning and Memory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or PSYC 110; or consent of instructor. Covers mechanisms of learning and memory across levels of analysis including genetic, neuronal, systems, and theory. Topics include the multiple memory systems, memory consolidation, working memory, emotional memory, recognition memory, spatial memory, and human amnesia. Cross-listed with CBNS 126.

PSYC 127 Behavioral Control Systems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 120/PSYC 120; CBNS 124/PSYC 124 strongly recommended. An analysis of neural mechanisms that underlie behavior, concentrating on motor control. Topics range from command systems, to central pattern generators, to cortical control of voluntary movement and brain-machine interfaces (neuroprosthetics). Cross-listed with CBNS 127.

PSYC 128 Language and the Brain 4 Lecture, 3 hours; research, 2 hours; extra reading, 2 hours. Prerequisite(s): LING 020 or PSYC 110 or PSYC 135 or CBNS 106; or consent of instructor. Interdisciplinary introduction to the study of language and the brain. Includes brain evolution for language, neural bases for language production and language comprehension, aphasiology and language disorders, and additional special topics. Cross-listed with LING 162.

PSYC 129 Human Neuropsychology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001 with a grade of C- or better; PSYC 002 with a grade of C- or better; PSYC 011 with a grade of C- or better; PSYC 012 with a grade of C- or better; or consent of instructor. Surveys how high-level psychological functions (e.g., perception, memory, language) are organized in the human brain. Covers behavioral and cognitive impairments due to disorders such as brain injury, stroke, Parkinson's disease, epilepsy, and dementias including Alzheimer's disease. Emphasizes how such disorders inform our understanding of cognitive functions.

PSYC 130 Fundamentals of Learning and Conditioning 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. A survey course that includes both historical and current models of human learning, conditioning, and memory. Provides a good foundation for research or future study in learning and memory by covering fundamental theories established by Pavlov and Skinner while incorporating new theories of human behavioral control.

PSYC 131 Computational and Mathematical Models in Cognitive Science 4 Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): a grade of "C-" or better in PSYC 001, PSYC 002, PSYC 011, PSYC 012 or consent of instructor. Introduces students to the technical and theoretical issues involved in using models to understand behavior. Involves analysis of model predictions and simulation of behavioral data. Course is repeatable to a maximum of 12 units if taken with different instructors.

PSYC 132 Perception 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. An analysis of the role played by sensory mechanisms, experiences, expectations, and needs in recognizing objects in the environment.

PSYC 133 Human Factors 4 Lecture, 3 hours; extra reading, 3 hours; term paper, 1 hour. Prerequisite(s): a grade of "C-" or better in one of the following courses or consent of instructor: PSYC 132 or PSYC 134. Provides an overview of the human capabilities and limitations considered in the design of person-machine systems. Evaluates factors critical to performance in person-machine systems, including attention, decision making, motor performance, and memory.

PSYC 134 Cognitive Processes 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001 with a grade of C- or better; PSYC 002 with a grade of C- or better; PSYC 011 with a grade of C- or better; PSYC 012 with a grade of C- or better; or consent of instructor. Addresses empirical and theoretical research in several subareas within contemporary cognitive psychology. Subareas include attention, mental representation, information organization and retrieval from memory, psycholinguistics, problem solving, decision making, thinking, and artificial intelligence and computer simulation of cognitive processes.

PSYC 135 Psycholinguistics 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a grade of "C-" or better in the following courses or consent of instructor: PSYC 001, PSYC 002, PSYC 011, PSYC 012. Introduction to psycholinguistics emphasizing the psychological implications of linguistic theory, including the effect of syntactic structure on the comprehension, production, and retention of speech; the course of language acquisition; and models of the adult language user.

PSYC 136 Topics in Cognitive Neuroscience 4 Seminar, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): a grade of "C-" or better in one of the following courses or consent of instructor: CBNS 106, PSYC 110, PSYC 129, PSYC 132, PSYC 134, PSYC 135. Intensive study of selected topics in cognitive neuroscience. Stresses the methodology and interpretation

of current research topics. Course is repeatable as topics change to a maximum of 12 units.

PSYC 139 Topics in Cognitive Psychology 4 Seminar, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): a grade of "C-" or better in the following courses or consent of instructor: PSYC 001, PSYC 002, PSYC 011, PSYC 012; PSYC 132 or PSYC 134 or PSYC 135. Intensive study in cognitive psychology. Stresses literature, methodology, and experimental design and analysis. Course is repeatable as topics change to a maximum of 16 units.

PSYC 140 Social Psychology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. The relationship between the individual and the group, including such topics as conformity and deviance, attraction and prejudice, altruism and aggression, and the social nature of attitudes.

PSYC 142 Industrial/Organizational Psychology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 002. Introduction to the field of industrial/organizational psychology covering fundamental theory and research in personnel and organizations. Topics include employee selection and training, performance appraisal, motivation, organizational dynamics, leadership, and job satisfaction.

PSYC 148 Topics in Social Psychology 4 Lecture, 3 hours; extra reading or term paper, 3 hours. Prerequisite(s): a grade of "C-" or better in the following courses or consent of instructor: PSYC 001, PSYC 002, PSYC 011, PSYC 012, PSYC 140. Intensive study of selected topics in social psychology such as race relations, attitude formation and change, biases of social science researchers, and the application of psychological principles in community organization. Emphasis is on the study of these areas in natural settings. Specific course content varies. Course is repeatable to a maximum of 16 units.

PSYC 149 The Science of Well-Being 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001 and PSYC 002. Covers current theory and research in positive psychology and the scientific study of optimal human functioning. Topics include the causes and benefits of happiness; how happiness can be measured and increased; positive emotions; flow; and human strengths and virtues including optimism, love, altruism, forgiveness, and gratitude.

PSYC 150 Personality 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. A survey of the principal theories of personality with attention to the experimental methods and findings on which they are based.

PSYC 151 Psychopathology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001 with a grade of C- or better; PSYC 002 with a grade of C- or better; PSYC 011 with a grade of C- or better; PSYC 012 with a grade of C- or better; or equivalents; or consent of instructor. An introduction to the research and theories regarding the major types of abnormal behavior. Includes the neuroses, schizophrenia, psychosomatic disorders, sexual disorders, drug and stress induced states, and organic disorders.

PSYC 153 Introduction to Clinical Psychology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): a grade of "C-" or better in the following courses or consent of instructor: PSYC 001, PSYC 002, PSYC 011, PSYC 012, PSYC 152. Introduction to the field of clinical psychology. Emphasizes the application and evaluation of techniques of individual and group counseling and therapy. Also addresses the application and evaluation of psychological tests in the assessment of psychological problems.

PSYC 155 Personality Assessment 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): a grade of "C-" or better in the following courses or consent of instructor: PSYC 001, PSYC 002, PSYC 011, PSYC 012, PSYC 150. Covers the assessment of personality through self-report tests, projective tests, and systematic observations. Also entails descriptions of the psychometrics of testing as it applies to the problems in studying personality.

PSYC 160 Life Span Development 5 Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): PSYC 001 with a grade of C- or better; PSYC 002 with a grade of C- or better; PSYC 011 with a grade of C- or better; PSYC 012 with a grade of C- or better. Introduces the biological, social, and cognitive processes that influence development from the prenatal period through late adulthood. Topics include development in physical, motor, perceptual, cognitive, emotional, and social areas. Includes discussion of issues related to intellectual functioning, personality, social roles and relationships, coping and adjustment, and aging.

PSYC 161 Socioemotional and Personality Development 5 Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): PSYC 001 with a grade of C- or better; PSYC 002 with a grade of C- or better; PSYC 011 with a grade of C- or better; PSYC 012 with a grade of C- or better; or consent of instructor. A study of the development of human personality from birth through late adolescence. Emphasizes the impact of interpersonal relationships on the acquisition of human traits, emotional reactions, and patterns of adjustment.

PSYC 162 Biological Issues in Development 5 Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, and PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. Examines biological processes that influence behavior and development across the life span. Discusses contemporary theoretical approaches to the study of biological, genetic, and environmental influences on development. Topics include behavioral genetics, developmental neuroscience, and the impact of early environments and stress on adaptation and resilience.

PSYC 163 Cognitive Development 5 Lecture, 3 hours; discussion, 1 hour; term paper, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, and PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. An analysis of intellectual development from birth through maturity and into stages of aging. Discusses historical and contemporary theoretical and experimental approaches to studying the mechanisms of intellectual growth and development.

PSYC 164 Emotional and Behavioral Disorders of Childhood 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, PSYC 152, and PSYC 160 with grades of C- or better; or equivalents; or consent of instructor. Provides an overview of behavioral and emotional disorders affecting children and adolescents within a developmental context. Examines disorders affecting youth in terms of prevalence, developmental course, and theories. Topics include theoretical models of child psychopathology; diagnostic, assessment, and treatment practices; and the descriptive psychopathology of major childhood disorders.

PSYC 165A The Cultural Bases of Human Development 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001 with a grade of C- or better, PSYC 002 with a grade of C- or better, PSYC 011 with a grade of C- or better, PSYC 012 with a grade of C- or better, PSYC 160 with a grade of C- or better or PSYC 161 with a grade of C- or better or PSYC 162 with a grade of C- or better or PSYC 163 with a grade of C- or better; or equivalents; or consent of instructor. Examines the social, emotional, and intellectual aspects of human development from a cultural perspective. Covers theory, research, and methods of studying the cultural bases of psychological growth. Topics include socialization practices, parenting, social relations, language and cognition, schooling and academic achievement, acculturation, and ethnicity.

PSYC 165B The Development of Immigrant and Ethnic Minority Youth 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001 with a grade of C- or better, PSYC 002 with a grade of C- or better, PSYC 011 with a grade of C- or better, PSYC 012 with a grade of C- or better, PSYC 160 with a grade of C- or better or PSYC 161 with a grade of C- or better or PSYC 162 with a grade of C- or better or PSYC 163 with a grade of C- or better; or equivalent; or consent of instructor. Covers current theory and research on the development of immigrant and ethnic minority youth in the United States. Focuses on the social, cultural, and psychological processes influencing the biological, cognitive, and social development of youth from immigrant and ethnic minority families.

PSYC 166A Infancy 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001 with a grade of C- or better; PSYC 002 with a grade of C- or better; PSYC 011 with a grade of C- or better; PSYC 012 with a grade of C- or better; or consent of instructor. Covers current

theory and research on development during the period of infancy. Addresses the key biological, cognitive, emotional, and social developments during this period.

PSYC 166B Childhood 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 all with grades of "C-" or better; or consent of instructor. Covers current theory and research on development during the period of childhood. Addresses the key biological, cognitive, emotional, and social developments during this period.

PSYC 166C Adolescence and Emerging Adulthood 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001 with a grade of C- or better; PSYC 002 with a grade of C- or better; PSYC 011 with a grade of C- or better; PSYC 012 with a grade of C- or better. Covers current theory and research on development during the period of adolescence and the transition to adulthood. Addresses the key biological, cognitive, emotional, and social developments during this period.

PSYC 166D Adulthood and Aging 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 all with grades of "C-" or better; or consent of instructor. Covers current theory and research on development during the period of adulthood and the process of aging. Addresses the key biological, cognitive, emotional, and social developments during this period.

PSYC 167 Psychological Development of Black Youth in Context 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 002. Covers theoretical and scientific approaches to the study of Black youth's development (birth to late adolescence) from a strengths-based perspective. Considers social contexts including family, peers, schools, neighborhoods, media, and other institutions that inform Black youth's development. Covers research and theory from psychology, education, sociology, legal studies, and ethnic studies. Cross-listed with ETST 167.

PSYC 168 Psychological Aspects of the Black Experience 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 002. Examines psychological explanations, theoretical models, and empirical research to promote an understanding of how personal characteristics, culture, and social conditions inform the Black American experience. Explores structural factors, group membership, lifestyles, ethno-historical factors, and wider societal influences to understand the uniqueness of the Black experience. Cross-listed with ETST 168.

PSYC 169 Topics in Developmental Psychology 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PSYC 001 with a grade C- or better; PSYC 002 with a grade C- or better; PSYC 011 with a grade C- or better; PSYC 012 with a grade C- or better; PSYC 160 with a grade C- or better or PSYC 161 with a grade C- or better or PSYC 162 with a grade C- or better or PSYC 163 with a grade C- or better. Intensive study in developmental psychology. Stresses literature, methodology, and experimental design and analysis. Specific course content varies. Course is repeatable to a maximum of 16 units as topics change.

PSYC 171 Psychology of Gender 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): PSYC 012 with a grade of "C-" or better or consent of instructor. Examines psychological theory and research on gender, including ethnic and cultural variations in male and female experience. Topics include gender roles, gender development, gender differences and stereotypes, biological influences on gender, gender and health, gender and language, gender and achievement, and men and women in the workplace.

PSYC 175 Psychology and Law 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001 with a grade of C- or better, PSYC 002 with a grade of C- or better or LWSO 100 with a grade of C- or better or LWSO 100H with a grade of B or better. A study of psychological theory and empirical research as it relates to the law. Topics include jury decision making, eyewitness memory, child custody, criminal responsibility and intent, competence, rehabilitation and punishment, ethics and legal responsibilities in therapy, and psychological research.

PSYC 178 Health Psychology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 002 or SOC 001 or SOC 001H. An examination of the importance of interpersonal relationships to physical health and effective medical care. Applies social psychological perspectives to such topics as stress-related diseases, placebo effects, doctor-patient interactions, dying, and the hospital environment.

PSYC 182 (E-Z) Laboratory in Psychology 5 Lecture, 3 hours; research, 3 hours; term paper, 3 hours. Prerequisite(s): for PSYC 182E: PSYC 160 or PSYC 161 or PSYC 162 or PSYC 163 with a grade of C- or better or consent of instructor; for PSYC 182F: PSYC 132 with a grade of C- or better or consent of instructor; for PSYC 182G: PSYC 140 and PSYC 150 with a grade of C- or better or consent of instructon; for PSYC 182I: PSYC 012 with a grade of C- or better or consent of instructor; for PSYC 182J; PSYC 132 or PSYC 134 with a grade of C- or better or consent of instructor; for PSYC 182K: PSYC 012 with a grade of C- or better or consent of instructor; for PSYC 182M: PSYC 134 with a grade of C- or better or consent of instructor; for PSYC 182N: PSYC 160 or PSYC 161 or PSYC 162 or PSYC 163 with a grade of C- or better or consent of instructor. Provides hands-on experience in various research approaches in psychology. Involves in-class discussion of research design and methods as well as outside data collection. Course is repeatable as content or topic changes to a maximum of 15 units.

PSYC 189 Advanced Topics in Psychology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, and PSYC 012 with grades of "C-" or better, or consent of instructor. Intensive study in psychology. Stresses literature, methodology, and experimental design and analysis. Specific course content varies. Course is repeatable as topics change to a maximum of 16 units.

PSYC 190 Special Studies 1 to 5 Prerequisite(s): upper-division standing with consent of instructor. Individual study under the direction of a faculty member. Course is repeatable to a maximum of 16 units.

PSYC 191A Seminar in Developmental Psychology Research 2 Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of selected topics of research in developmental psychology. Some combination of readings, short written assignments, and oral presentation is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

PSYC 191B Seminar in Neuroscience Research 2 Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of selected topics of research in neuroscience. Some combination of readings, short written assignments, and oral presentation is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

PSYC 191C Seminar in Personality Psychology Research 2 Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of selected topics of research in personality psychology. Some combination of readings, short written assignments, and oral presentation is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

PSYC 191D Seminar in Social Psychology Research 2 Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of selected topics of research in social psychology. Some combination of readings, short written assignments, and oral presentation is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

PSYC 191E Seminar in Cognitive Psychology Research 2 Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of selected topics of research in cognitive psychology. Some combination of readings, short written assignments, and oral presentation is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

PSYC 194 Independent Reading 1 to 4 Prerequisite(s): upper-division standing with consent of instructor. Individual reading under faculty direction. Course is repeatable to a maximum of 4 units.

PSYC 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): restricted to class level standing of junior, or senior; and consent of instructor. Directed original research. Course is repeatable. Credit is awarded for one of the following PSYC 197 or PSYC 197L.

PSYC 197L Research Laboratory For Undergraduates 1 to 4 Laboratory, 3 to 12 hours. Prerequisite(s): restricted to class level standing of junior, or senior; and consent of instructor. Directed original research. Course is repeatable to a maximum of 16 units. Credit is

awarded for one of the following PSYC 197L or PSYC 197.

PSYC 198 R'course: Variable Topics 1 Activity, 1 to 3 hours. Prerequisite(s): permission needed from department is required. An opportunity for UCR undergraduate students to develop leadership skills, innovate the undergraduate curriculum, and promote democratic, experiential education. Original course topics are variable and unique from other departmental course offerings, designed to highlight the student facilitators' expertise while working closely with a faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 8 units.

PSYC 198G Group Internship in Psychology 2 to 5 Lecture, 1 hour; internship, 4 to 10 hours; written assignments, 2-4 hours. Prerequisite(s): PSYC 002 or consent of instructor. Supervised clinical experience in community settings such as mental health clinics, hospitals, and group homes. A written assignment such as a short research paper or a weekly journal is required. Enrollment is for 4 units; a rare exception may be made, in writing, by the instructor for 2, 3, or 5 units. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units

PSYC 198H Junior Honors Research 2 Research, 6 hours. Prerequisite(s): restricted to class level standing of junior; restricted to major(s) Psychology; admission to University Honors. Honors course corresponding to PSYC 198HL. Original research performed under the direction of individual faculty members. Course is repeatable to a maximum of 4 units. Credit is awarded for one of the following PSYC 198H or PSYC 198HL.

PSYC 198HL Junior Honors Research Laboratory 1 to 2 Laboratory, 3 to 6 hours. Prerequisite(s): restricted to class level standing of junior; and consent of instructor. Honors course corresponding to PSYC 198H. Original research performed under the direction of individual faculty members. Satisfactory(S) or No Credit(N/C) is not available. Course is repeatable to a maximum of 4 units. Credit is awarded for one of the following PSYC 198HL or PSYC 198H.

PSYC 198I Individual Internship in Psychology 2 to 8 Internship, 4 to 16 hours; consultation, 1 hours; written work, 1 to 4 hours; individual study, 0 to 4 hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, and PSYC 012 with grades of "C-" or better; upper-division standing; consent of instructor. Individual internship in nonclinical psychology fieldwork. The student spends three hours per week in a prescribed combination of academic activities and internship for each unit of credit. Students keep a weekly log and write a summary of the internship experience. Students who complete additional assigned reading and submit a substantive term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 16 units.

PSYC 199 Senior Thesis Research 1 to 5 Research, 3 to 15 hours. Prerequisite(s): restricted to class level standing of senior; restricted to major(s) Psychology; and consent of instructor. Original research undertaken under the direction of individual faculty members. Psychology Department undergraduates may enroll for 2 units each quarter of their senior year except for the thesis-writing quarter. Course is repeatable to a maximum of 16 units. Credit is awarded for one of the following PSYC 199, PSYC 199H, PSYC 199HL, or PSYC 199L.

PSYC 199H Senior Honors Research 1 to 5 Research, 3 to 15 hours. Prerequisite(s): restricted to class level standing of senior; restricted to major(s) Psychology; admission to University Honors; and consent of instructor. Honors course corresponding to PSYC 199. Original research undertaken under the direction of individual faculty members. Program participants must enroll for 2 units each quarter of their senior year except for the thesis-writing quarter. Course is repeatable as content or topic changes to a maximum of 16 units. Credit is awarded for one of the following PSYC 199H, PSYC 199, PSYC 199HL, or PSYC 199L.

PSYC 199HL Senior Honors Research Laboratory 1 to 5 Laboratory, 3 to 15 hours. Prerequisite(s): restricted to class level standing of senior; and consent of instructor. Honors course corresponding to PSYC 199L. Original research undertaken under the direction of individual faculty members. Program participants must enroll for 2 units each quarter of their senior year except for the thesis-writing quarter. Satisfactory(S) or No Credit(N/C) is not available. Course is repeatable to a maximum of 16 units. Credit is awarded for one of the following PSYC 199HL, PSYC 199, PSYC 199H, or PSYC 199L.

PSYC 199L Senior Thesis Research Laboratory 1 to 5 Laboratory, 3 to 15 hours. Prerequisite(s): restricted to class level standing of senior; and consent of instructor. Original research undertaken under the direction of individual faculty members. Psychology Department undergraduates may enroll for 2 units each quarter of their senior year except for the thesis-writing quarter. Course is repeatable to a maximum of 16 units. Credit is awarded for one of the following PSYC 199L, PSYC 199, PSYC 199H, or PSYC 199HL.

Graduate Courses

PSYC 200A Fundamentals of Neuroscience 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with NRSC 200A.

PSYC 200B Fundamentals of Neuroscience 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor; NRSC 200A/PSYC 200A. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with NRSC 200B.

PSYC 200C Fundamentals of Neuroscience 3 Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor; NRSC 200B/PSYC 200B. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with NRSC 200C.

PSYC 203A Cogniton and Cogntive Neuroscience 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Biomedical Sciences, Neuroscience, Psychology; graduate standing; or consent of instructor. Addresses cognitive theories and cognitive neuroscience approaches to the study of perception, attention, and action. Course is repeatable to a maximum of 6 units.

PSYC 203B Cognition and Cognitive Neuroscience 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) , Biomedical Sciences, Neuroscience, Psychology; graduate standing; or consent of instructor. Addresses cognitive theories and cognitive neuroscience approaches to the study of attention, memory, and learning. Course is repeatable to a maximum of 6 units.

PSYC 203C Cognition and Cognitive Neuroscience 3 Lecture, 3 hours. Prerequisite(s): Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Addresses cognitive theories and cognitive neuroscience approaches to the study of memory, learning, language, and decision making. Course is repeatable to a maximum of 6 units.

PSYC 207A Theories in Developmental Psychology 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. A consideration of major issues and theories in the area of developmental psychology. Covers social learning theory, structural theories, sociobiology, and theories of personality development. Topics include life span models and plasticity of human behavior.

PSYC 207B Social Development 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Provides theoretical and empirical consideration of various topics in social development including attachment, aggression, dependency, cooperation, and competition. Also considers methodological issues appropriate to investigations of these phenomena.

PSYC 207C Processes of Cognitive Development 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Biomedical Sciences, Psychology; graduate standing; or consent of instructor. Examines the cognitive changes in humans throughout the life cycle. Topics include Piagetian theory and memory, information processing, attention, and intelligence with a focus on the changes that occur in these skills.

PSYC 208 Research Methods in Development 3 Lecture, 3 hours. Prerequisite(s): PSYC 211; PSYC 212; restricted to major(s) Biomedical Sciences, Psychology; graduate standing; or consent of instructor. Develops skills in evaluating current research methodologies to answer developmental questions and in critically evaluating a variety of research methodologies currently in use. Topics include measurement of developmental dimensions and methods for assessing interrelations among developmental dimensions.

PSYC 210 Preparing Research Proposals in Psychology 3 Seminar, 3 hours; written work, 2 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Designed for advanced graduate psychology majors planning a research career. Focuses on funding opportunities for predoctoral research support. Topics include sources of grant support, mechanisms of grant support, and essentials of grant writing. Graded Satisfactory (S) or No Credit (NC).

PSYC 211 Data Analytic Methods 1 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): restricted to major(s) Business Administration, Chemistry with Education Focus, Psychology; graduate standing; or consent of instructor. Examines basic issues related to the application of statistical inference, effect size estimation, and significance tests to various research paradigms in psychology. Discusses aspects of psychological measurement and the appropriateness of particular statistical techniques to different types of psychological data.

PSYC 212 Data Analytic Methods 2 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): PSYC 211; restricted to major(s) Business Administration, Chemistry with Education Focus, Psychology; graduate standing; or consent of instructor. Covers multiple regression, the general linear model, their relationship to analysis of variance, and extensions to multivariate analysis. Also addresses the use of assorted computer statistical packages.

PSYC 213 Advanced Data Analytic Methods 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): PSYC 211, PSYC 212; restricted to major(s) Psychology; graduate standing; or consent of instructor. Teaches how to analyze and interpret research data using techniques that build off a traditional multiple correlation/regression framework. Covers interaction terms (e.g., polynomial terms, moderation, two-way ANOVA), and analyses specifying non-normal distributions such as logistic regression.

PSYC 214 Latent Variable Analysis 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): PSYC 211, PSYC 212; restricted to major(s) Psychology; graduate standing; or consent of instructor. Covers latent variable models including principal component analysis, factor analysis, structural equation modeling, and related approaches. Also covers the use of statistical packages to fit exploratory and confirmatory latent variable models. Includes hands-on exercises to reinforce the application of the techniques to example data.

PSYC 215 Qualitative Data Analytic Methods 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Explores qualitative research design, data collection, and analysis with emphasis on developmental psychology. Topics include coding, thematic analysis, reflexivity, and critical methodologies.

PSYC 225 Theories and Concepts of Social Psychology 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Medical and Health Humanities, Psychology; graduate standing; or consent of instructor. Covers advanced theories and concepts of social psychology. Focuses on the history and development of the major concepts of the field. Required of all social-personality graduate majors.

PSYC 226 Theories and Concepts of Personality Psychology 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Explores advanced critical review of the theories, assessment techniques, and empirical literature in personality psychology. Focuses on the interactionist perspective. Required of all social-personality graduate majors.

PSYC 227 Research Methods in Social and Personality Psychology 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Covers laboratory and field research methods, personality and dependent variable measurement, research design, bias and artifacts, and meta-analysis. Also addresses interview and surveys, focus groups, research publication, and ethics.

PSYC 231 Mathematical and Computational Models in Cognitive Science 3 Lecture, 3 hours; extra reading, 1.5 hours; written work, 1.5 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Introduces the technical and theoretical issues involved in using models to understand behavior. Emphasizes hands-on analysis of model predictions and simulation of behavioral data. Must be taken with different instructors to receive repeat credit. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

PSYC 233 Research Methods in Cognition and Cognitive Neuroscience 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Biomedical Sciences, Psychology; graduate standing; or consent of instructor. Develops skills in various research methodologies currently available to cognitive scientists including programming languages, computational approaches, and neuroimaging methods (EEG, MRI, TMS). Emphasizes learning to implement the method. Includes critically examining assumptions of the method in how it is being used to address theoretical and empirical questions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 9 units.

PSYC 234 Data Analysis in Cognitive Sciences 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Focuses on the analysis of cognitive psychological data obtained using specialized methodologies particularly relevant to cognitive psychology research including computer simulation, online experimentation, and eye tracking. Topics include real-time data analysis, signal detecting theory, Fourier analysis, and reaction time data. Must be taken with different instructors to receive repeat credit. Course is repeatable to a maximum of 9 units.

PSYC 243 Topics in Multivariate Statistics 3 Lecture, 3 hours; laboratory, 1 hour. Prerequisite(s): PSYC 211, PSYC 212; PSYC 213 or PSYC 214; restricted to major(s) Management, Psychology; graduate standing; or consent of instructor. A study of selected advanced topics in quantitative methods specifically for behavioral research (especially multivariate analysis). Focuses on the theoretical and practical applications of quantitative methods. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content or topic changes.

PSYC 251 Seminar in Cognitive Neuroscience. 3 Seminar, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Consists of seminars, oral reports, and discussions by students, faculty, and visiting scholars on current trends in cognitive neuroscience. Focuses on a memory phenomenon. Graded Satisfactory (S) or No Credit (NC). Course is repeatable

PSYC 255 Seminar in Social Psychology 3 Seminar, 3 hours. Prerequisite(s): restricted to major(s) Medical and Health Humanities, Psychology; graduate standing; or consent of instructor. Selected advanced topics in social psychology. Course content will vary. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PSYC 256 Seminar in Perception 3 Seminar, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Promotes study and discussion of experimental papers in relation to the theory of perceptual processes. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PSYC 257 Seminar in Personality Psychology 3 Seminar, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Selected advanced topics in personality emphasizing experimental findings and theoretical interpretations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PSYC 258 Seminar in Developmental Psychology 3 Seminar, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Selected advanced topics in developmental psychology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PSYC 259 Topics in Quantitative Methods 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. A study of selected advanced topics in quantitative methods specifically for behavioral research (especially multivariate analysis). Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PSYC 262 Developmental Biopsychology 3 Lecture, 3 hours. Prerequisite(s): restricted to major(s) Medical and Health Humanities, Psychology; graduate standing; or consent of instructor. Covers basic processes of brain development and plasticity from conception to adulthood. Emphasizes relationships between biological and psychological phenomena such as sensation, perception, and learning. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) No Credit (NC) grade.

PSYC 263 Seminar in Behavioral Neuroscience 3 Seminar, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Consists of readings, oral reports, and discussions by students, faculty, and visiting scholars of selected areas in behavioral neuroscience. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 36 units.

PSYC 265 Auditory Neuroscience 3 Seminar, 3 hours. Prerequisite(s): NRSC 200C or PSYC 200C; restricted to major(s) Neuroscience, Psychology; graduate standing; or consent of instructor. Studies ways in which the mammalian auditory system is organized and functions. Focuses on aspects of auditory physiology that gives rise to auditory perceptions. Emphasizes the use of the auditory system to understand principles of sensory system organization and to compare and contrast different sensory modalities.

PSYC 270 Current Research in Quantitative Psychology 2 Seminar, 2 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Discusses selected research topics in quantitative psychology. Emphasizes contemporary research design and quantitative problems relevant to the on going research areas of graduate students and faculty. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

PSYC 271 Current Issues in Cognition 3 Seminar, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Examines current issues in memory, learning, and psycholinguistics. Emphasizes recent and important experimental findings and theoretical development. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PSYC 276 Intro to Neuroimaging With Mri 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Focuses on the use of magnetic resonance imaging (MRI) in the study of the brain. Topics include structural imaging, functional imaging, diffusion tensor imaging, and brain connectivity. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with BIEN 276.

PSYC 283 Proseminar On Current Research in Cognitive Psychology 1 Seminar, 1.5 hours; written work, 4 hours per quarter; extra reading, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Presentations by students, departmental faculty, or visiting scholars describing current research in cognitive psychology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

PSYC 284 Proseminar On Current Research in Developmental Psychology 1 Seminar, 1 hour; written work, 4 hours per quarter; extra reading, 1 to 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Presentations by students, departmental faculty, and visiting scholars describing current research in developmental psychology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

PSYC 285 Proseminar On Current Research in Social/Personality Psychology 1 Seminar, 1 hour; written work, 4 hours per quarter; extra reading, 1 to 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Presentations by students, departmental faculty, and visiting scholars describing current research in social/personality psychology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

PSYC 286 (E-Z) Proseminar in Psychology 1 Seminar, 9 hours; extra reading, 18 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Covers selected advanced topics in Psychology. Content of each segment varies. See individual segments for descriptions. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

PSYC 286E Proseminar in Diversity and Inequality 1 Seminar, 9 hours per quarter; extra reading, 18 hours per quarter. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Discusses assigned readings on the study of diversity and inequality through the lens of psychology and related disciplines. Includes presentations by students, faculty, and visiting scholars describing current research in diversity and inequality. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

PSYC 286F Proseminar in Health and Well Being 1 Seminar, 9 hours; extra reading, 18 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Discusses assigned readings on the study of health and well-being through the lens of psychology and related disciplines. Includes presentations by students, faculty, and visiting scholars describing current research in health and well-being. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

PSYC 287 Colloquium in Neuroscience 1 Colloquium, 1 hour. Prerequisite(s): restricted to major(s) Neuroscience, Psychology; graduate standing; or consent of instructor. Involves oral presentations on current research topics in neuroscience by visiting scholars, faculty, and students. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with NRSC 287.

PSYC 289 Special Topics in Neuroscience 2 Seminar, 2 hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussion of selected topics in neuroscience. Content and instructor(s) vary each time course is offered. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with BCH 289, BIOL 289, CHEM 289, ENTM 289, and NRSC 289.

PSYC 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Advanced work in a topic or topics appropriate to the student's special interests and needs. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PSYC 291 Individual Study in Coordinated Areas 1 to 6 Research, 3 to 18 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. A program of study designed to advise and assist candidates who are preparing for doctoral examinations. Units do not count toward the Master's Degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PSYC 292 Concurrent Analytical Studies 1 to 4 Research, 3 to 12 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Each 292 course will be taken concurrently with a 100-series course, but on an individual basis. It will be devoted to specific additional projects related to the 100-series course. Faculty guidance and evaluation will be provided through the quarter. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PSYC 296 Research Tutorial 3 Research, 6 hours; extra reading, 3 hours; written work, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Research performed under the supervision of a faculty advisor. Course is repeatable to a maximum of 18 units.

PSYC 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Minor research studies or exploratory work toward the development of the dissertation problem. Graded Satisfactory (S) or No Credit (NC).

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Course is repeatable.

PSYC 299 Research For Thesis Or Dissertation 1 to 12 Thesis, 3 to 36 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Research for thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

PSYC 301 Teaching Psychology at the College Level 2 Seminar, 1 hour; practicum, 3 hours. Prerequisite(s): admission to graduate standing in Psychology Teaching Assistant Development. Program offered by the Teaching Assistant Development Office of the Graduate Division. Required prior to or concurrent with the student's first teaching assistant appointment. May be waived by petition based on previous experience. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PSYC 409A Professional Development and Research Ethics For Early Career Graduate Students 3 Seminar, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing. Designed for beginning graduate students planning an academic or research career in psychology. Includes transition to graduate school, setting career goals, time management, professional and research ethics, scientific writing and publication, preparation of fellowship applications, and oral presentation skills. Graded Satisfactory (S) or No Credit (NC).

PSYC 409B Professional Development 3 Seminar, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing. Designed for advanced graduate students planning a teaching and/or research career in psychology. Covers teaching; conducting research; interviewing, writing, and oral presentation skills; the academic job market and the job application process; and non-academic careers.

PSYC 409C Grant Writing For Psychological Sciences 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): restricted to major(s) Psychology; graduate standing; or consent of instructor. Provides hands-on experience with grant writing techniques and an overview of the grant review process. Graded Satisfactory (S) or No Credit (NC).

Public Health Graduate Program

Subject abbreviation: PBHL
School of Medicine
Division of Clinical Sciences
Department of Social Medicine, Population, and Public Health
smpph.ucr.edu/

Deborah Deas, M.D., M.P.H., Vice Chancellor, Health Sciences; the Mark and Pam Rubin Dean, UCR School of Medicine
Mark Wolfson, Ph.D., Department Chair
Mario Sims, Ph.D., FAHA Faculty Director

Program Faculty (2025-2026 Course Instructors)

Brandon Brown, Ph.D., M.P.H.
Ann Cheney, Ph.D.
Timothy Collins, Ed.D., M.H.A., FACHE, EMT
Lisa R. Fortuna, MD, MPH, MDiv, DFAPA
Wei Vivian Li, Ph.D.
Marshare Penny, Dr.P.H., M.P.H.
Michelle V. Porche, EdD
Mario Sims, Ph.D.
Andrew Subica, Ph.D.
Mark Wolfson, Ph.D.
Denise Woods, Dr.P.H.
Jeffrey Zhang, Ph.D.

The UCR MPH is an interdepartmental program, drawing one or more affiliated faculty from 16 different departments across UCR schools and colleges, including the School of Medicine; School of Public Policy; College of Humanities, Arts, and Social Sciences; College of Natural & Agricultural Sciences; and Marlan and Rosemary Bourns College of Engineering.

The MPH program focuses on community health equity and aims to train future public health leaders with rigorous interdisciplinary instruction. The program aligns with the school's mission to enhance the health of the people of Inland Southern California.

Features of the MPH curriculum include:

- Interdisciplinary courses
- Practical experience in public health
- Elective courses
- 2-year cohort-based program
- 68 total units

Admissions Requirements
Applications for the MPH program, which is administratively housed within the UCR School of Medicine, are accepted for fall entry. Applicants must have completed a bachelor's degree or an approved equivalent from an accredited institution. Applicants whose first language is not English are required to submit acceptable scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS). Additionally, each applicant must submit three letters of recommendation (at least one letter of recommendation must be an academic reference; the others may reflect work or internship experience).

The MPH Program's holistic admissions process considers the following criteria:

- Academic performance as reflected in the applicant's GPA, relevant coursework, Resume/CV, and GRE (optional)
- Commitment to serving Inland Southern California and/or other medically underserved areas and to promoting health equity as reflected in the applicant's personal statement, statement of purpose, letters of recommendation, and/or resume/CV
- Insight on and/or experience in working with communities as reflected in the applicant's personal statement, letters of recommendation, and/or resume/CV
- Interest in and career goals related to public health as reflected in work, volunteer, and life experiences described in the application, personal statement, letters of recommendation, and/or resume/CV.

The Admissions Committee carefully evaluates each applicant's academic abilities and their potential contributions to the public health workforce, particularly in improving the health of individuals in underserved communities.

For additional information on admission requirements and important dates and deadlines, please visit: smpph.ucr.edu/master-public-health.

Program of Study
The MPH program consists of a minimum of 68 units of graduate courses. The curriculum consists of required core courses, an applied public health practice experience (practicum), a required capstone research project or thesis, and elective courses.

The curriculum consists of the items below:

1. **Public Health Core: (9 courses)** PBHL 200; PBHL 201; PBHL 202A; PBHL 203; PBHL 204; PBHL 205; PBHL 202B; PBHL 206 and PBHL 207
2. **Statistics for Public Health (2 Courses):** STAT 233A & STAT 233B
3. **Health Behavior & Policy Interventions Elective (1 course)**
4. **Additional Public Health Related Electives (3 courses)**
5. **Applied Public Health Practice Experience (Practicum) (4 units):** PBHL 298i
6. **Integrative Learning Experience (4 units):** Students may choose to complete either Plan I (Thesis) or Plan II (Capstone Project)
   - **Plan 1 (Thesis):** Students must submit a master's thesis in accordance with the general requirements of the university. The thesis is original research work, and it should demonstrate the student's ability to study a research area, identify an open public health problem, analyze the problem, and make a research contribution. The thesis requires a presentation and must be approved by a committee of at least three faculty members.
   - **Plan 2 (Capstone Project):** Students must complete a research project under the guidance of a faculty member. The project will be approved by a committee of at least two faculty members and requires a presentation and written report.

   Mode option(s) The final thesis defense

and capstone project presentation can be taken in one of the following modes:

- **In-Person** – all committee members and student physically present
- **Hybrid** – some committee members/student in-person, some committee members/student remote
- **Remote** – all committee members and student have the option to attend remotely

The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination.

Professional Development Training
Professional development training is offered to MPH students throughout the core curriculum. This training will include presentations, communications, grant writing, and research and career training. Students will complete a Leadership and Career Readiness Plan as part of their MPH Integrative Learning Experience.

Graduate Courses

PBHL 200 Foundations of Public Health 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Provides an introductory survey of the history, science, and principles of public health. Examines the major causes of morbidity and mortality in Inland Southern California, the United States, and globally. Introduces public health perspectives on health and illness, health inequities, and public health policy and practice locally, nationally, and globally.

PBHL 201 Research Methods For Public Health 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Aims to develop public health researchers who are deeply committed to driving meaningful change. Offers a practical exploration of the principles and practices of public health research such as design, communication, advocacy, and intervention with a central focus on health equity.

PBHL 202A Community Health Theory and Practice I 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers the theories and practices that describe and influence community health promotion. Includes examining the personal, social, and environmental factors that influence health status and behaviors, as well as the influence of individuals, groups, institutions, societal structures, and policies on these behaviors.

PBHL 202B Community Health Theory and Practice 2 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): PBHL 202A with a grade of C- or better; graduate standing; or consent of instructor. Applies theories and practices introduced in Community Health Theory and Practice 1. Focuses on building skills for developing community health interventions, project budgets, program implementation and evaluation, and grant proposal development.

PBHL 203 Ethics in Public Health 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers issues of scientific integrity including ethical issues in public health policy and practice; guidelines for responsible conduct of research; federal and international codes; administrative review and approval; conflict of interest; and privacy and safety of research participants. Satisfies the requirements for training in public health ethics.

PBHL 204 Epidemiology 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces the basic concepts of epidemiology including disease transmission, measures of disease impact, cohort studies, estimating prevalence and risk, causal inference, and analyses of epidemiologic data for historical and contemporary issues in public health.

PBHL 205 Environmental Health 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Examines the interdisciplinary relationship between environmental health and social justice emphasizing gender, race, class, and globalization as analytical lenses. Topics include urban pollution, workplace exposure, industrial catastrophe, invisible environmental hazards, community activism, reproductive health, global capitalism, and new health challenges imposed by climate change.

PBHL 206 Health Policy and Administration 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Provides an overview of the United States healthcare system including the programs, providers, policies, and payment systems. Addresses key issues encountered today with the organization and administration of health services and the prospective implications and consequences for the future.

PBHL 207 Program Planning and Evaluation For Public Health 4 Lecture, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Supports the development of knowledge and skills needed to conduct community health program planning and evaluation. Highlights on best practices that are effective, culturally responsive, equity-focused, and utilization-focused. Promotes the development of program and evaluation plans that are aligned with health issues of interest to communities.

PBHL 240 Policy to Promote Public Health 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): restricted to major(s) Public Health; graduate standing; or consent of instructor. Introduction to public and institutional policy. Covers foundations, development, implementation, and evaluation of public health policy. Examines examples of policy arenas in several public health domains including tobacco control, food and beverage policy, infectious disease, and social and structural determinants of health.

PBHL 241 Community Public Health Methods For Behavioral Health 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): restricted to major(s) Public Health; graduate standing; or consent of instructor. Introduces public health methods for conducting community-engaged and participatory behavioral health prevention, research, evaluation, and practice. Explores strategies for designing, implementing, and evaluating community-based interventions and prevention. Focuses on behavioral health and the social determinants of mental health including substance use disorders. Addresses health disparities and influencing policy.

PBHL 290 Directed Studies 1 to 6 Research, 3 to 18 hours. Prerequisite(s): petition for 290 course is required from graduate division; graduate standing; and consent of instructor. Explores literature or research topics under the direction of a faculty member. Provides opportunities to undertake advanced work on a topic appropriate to the special interests and needs. Allows for topics that are not covered in a regularly offered course on campus. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

PBHL 292 Concurrent Analytical Studies 1 to 4 Research, 3 to 12 hours. Prerequisite(s): completion of a PBHL 292 enrollment form; graduate standing; and consent of instructor. Taken concurrently with relevant 100-series course on an individual basis. Includes specific additional projects related to the 100-series course. Provides faculty guidance and evaluation throughout the quarter. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PBHL 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): completion of a PBHL 297 enrollment form; graduate standing; and consent of instructor. Exploratory research toward the development of research that is not directly related to a thesis or capstone project. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PBHL 298I Applied Public Health Practice Experience (practicum) 1 to 12 Written work, 1 to 12 hours; internship, 3 to 36 hours. Prerequisite(s): prior to registering for the MPH Applied Practice Experience (PBHL 298I) students must have their internship plan approved by both their site preceptor and their faculty internship advisor. A maximum of 4 quarter units may be counted toward the degree requirements. May be taken one, two or three quarters; graduate standing. Provides opportunities for those who are working towards an MPH degree to develop, apply, and demonstrate multiple competencies required for successful public health practice. Graded Satisfactory (S) or No Credit (NC). Graded in progress until 120 hours of internship is completed, at which time a final grade is assigned. Course is repeatable to a maximum of 16 units.

PBHL 299 Research For Thesis Or Capstone 1 to 12 Research, 3 to 36 hours. Prerequisite(s): completion of a PBHL 299 enrollment form; graduate standing; and consent of instructor. Provides opportunity for independent research related to the integrative learning experience thesis or capstone project. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Public Policy

Subject abbreviation: PBPL
School of Public Policy

School of Public Policy
Mark Long, MPP, Ph.D., Dean
Bruce Babcock, Ph.D., Associate Dean

Program Office, INTS 4146
(951) 827-5663;
spp.ucr.edu

Major

Public policy analysis is the use of decision-making theory and evidence-based methods to the study of substantive public policy problems. The objective of public policy analysis is to improve the quality of public policy-making by critically examining the design and relevance of public policies, their implementation and execution, and their impact on households, communities, and the society at large. By its very nature, policy analysis is multidisciplinary. For instance, policies to address health problems in society must draw on developments in philosophy, economics, political science, medicine, and ethics (among other disciplines).

Career Opportunities

A degree in public policy equips students to go into a range of different careers. Examples include working as a policy analyst for local, regional, state, or national government agencies; a governmental or public relations officer for a private sector firm; an employee of a public advocacy group; or as a leader of a community-based, non-profit organization.

New Student Seminar

PBPL 050 is a seminar designed for first year and transfer students that meets weekly with several aspirations including community building, orientation to the campus and the major, academic support and career exploration. The goal of this seminar is to set the foundation for the major and the students' experience at UCR. The seminar is for first-year and transfer students admitted in the Fall term. The seminar is recommended, but not required for completion of the degree. The seminar carries 2 units of academic credit and is graded on an "S/NC" basis.

University Requirements

See Undergraduate Studies section.

College Requirements

See School of Public Policy section.

Major Requirements

The major requirements for the B.A. degree in Public Policy are as follows:

Students will not be admitted into the major until they have completed PBPL 001 with a "C"grade or better.

1. **Lower-division requirements (six courses [at least 24 units])**
   a) PBPL 001
   b) PBPL 002
   c) ECON 003
   d) PBPL 004
   e) Math 004
   f) One course from CS 005 or CS 009A
2. **Upper-division requirements**
   a) Upper Division Core (3 courses required (at least 12 units)
   PBPL 100A, PBPL 100B, PBPL 101
   b) Upper Division Electives (8 courses required (at least 32 units)
   PBPL 102, PBPL 103, PBPL 105, PBPL 110, PBPL 121, PBPL 127, PBPL 130, PBPL 132, PBPL 150, PBPL 155, PBPL 157, PBPL 160, PBPL 162, PBPL 164, PBPL 166, PBPL 167, PBPL 170, PBPL 171, PBPL 172, PBPL 177, PBPL 178, PBPL 179, PBPL 180, PBPL 182, PBPL 184, PBPL 185, PBPL 186
3. **Public Policy Seminar/Colloquia**
   During the junior and senior years, students must enroll in PBPL 191 (Seminar in Public Policy), which includes attendance at public lectures to the campus community given by outside speakers — typically policy makers, administrators and researchers — on timely and important policy issues facing the Inland Empire, the state, the nation, and the world.
4. **Domestic or International Policy Practicum**
   In the third or fourth year of the program (or during the summer between the third and fourth years), students must undertake a policy practicum (PBPL 198-I), which consists of an internship (paid or voluntary) on a policy issue or problem with a local, state or federal government agency, nonprofit or for-profit organization, a trade association, a labor/trade union, or a public-affairs firm. The Public Policy Program Committee helps students locate internship opportunities. The internship provides students with an opportunity to gain real-world experience and apply the analytical skills learned in the classroom. Students enrolled in the UC Washington Center (UCDC) and UC Center Sacramento (UCCS) programs or the Education Abroad Program can apply that experience toward the policy practicum requirement, and do not need to undertake a separate internship.
5. **Senior Thesis (for Honors candidates only)**
   Students who have an outstanding academic record in their course work during the first three years of the program can become candidates for Honors in Public Policy during the spring quarter of their junior year. All honors candidates must enroll in a two-quarter senior thesis seminar (PBPL 195H) that will culminate in a written thesis covering a real policy problem of the student's choice. The thesis project could grow out of the practicum experience.

Minor

1. **Lower-division requirements (three courses [at least 12 units])**
   a) PBPL 001
   b) PBPL 002
   c) Select one course from the following PBPL 004, PBPL 006, or PBPL 010
2. **Upper-division requirements**
   Upper Division Electives (3 courses required (at least 12 units)
   PBPL 100A, PBPL 100B, PBPL 101, PBPL 102, PBPL 103, PBPL 105, PBPL 127, PBPL 130, PBPL 132, PBPL 150, PBPL 155, PBPL 157, PBPL 160, PBPL 162, PBPL 164, PBPL 166, PBPL 167, PBPL 170, PBPL 171, PBPL 172, PBPL 178, PBPL 180, PBPL 182, PBPL 185, PBPL 186
3. **Public Policy Seminar/Colloquia**
   During the junior and senior years, students must enroll in PBPL 191 (Seminar in Public Policy), which includes attendance at public lectures to the campus community by outside speakers — typically policy makers, administrators and researchers — on timely and important policy issues facing the Inland Empire, the state, the nation, and the world.

Combined B.A. + M.P.P. Five-Year Program

The School of Public Policy offers a combined B.A. + M.P.P. program in public policy, designed to lead to a Bachelor of Arts degree as well as a Master of Public Policy degree in five years. The coursework for the new program will be the same as that for the existing BA and MPP programs. Only students who are public policy majors with a cumulative GPA at least 3.0 overall and 3.3 in the major (upper division classes only, with a minimum of 16 units of these courses to be completed by the end of spring quarter of the junior year) are eligible to apply for this program before the end of their junior year. Students in the B.A. + M.P.P. program are allowed to count up to 12 units of MPP courses toward the upper-division track classes required for the BA program. Applicants to the combined program must include a statement of interest, indicating why the student is interested in an M.P.P. degree and how prior academic and work experience has prepared the student an M.P.P. degree, and a minimum of two recommendation letters from UCR faculty members, at least one of whom must be a faculty member in the School of Public Policy. The GRE requirement will be waived for these applicants.

Graduate Program

The School of Public Policy offers the Master of Public Policy (MPP) program leading to a Master's degree in public policy.

Admissions Requirements

Applications for the MPP program, which is housed within the UCR School of Public Policy, are accepted for fall entry. Applicants must have completed a bachelor's degree or an approved equivalent from an accredited institution, and must have successfully taken courses in microeconomics, statistics, and an introduction to politics and government, or their equivalent during their undergraduate study. Applicants whose first language is not English are required to submit acceptable scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS). Additionally, each applicant must submit three letters of recommendation, at least one letter of recommendation must be an academic reference

and any others can reflect work or internship experience. All other application requirements are specified in the graduate application.

Program of Study
The MPP program consists of 72 units of graduate courses. The curriculum consists of 11 required core courses, which includes a required policy internship, a required capstone research project spanning two quarters (which substitutes for a final examination), and a total of five elective courses.

Students entering the MPP program from the Graduate Preparatory Program in Public Policy (GPP-PP) from University Extension will complete 36 units. Of the 36 units, 16 units are required:

- PBPL 216
- PBPL 289A
- PBPL 289B
- PBPL 298I

The balance of the 20 units will include courses from the elective areas.

1. **Core Courses:**
   a) **The Policy Process (2 courses):** PBPL 200, PBPL 202
   b) **Policy Methods (6 courses):** PBPL 205, PBPL 210, PBPL 212, PBPL 214, PBPL 215, PBPL 220
   c) **Institutional Context (2 courses):** PBPL 216, PBPL 222
   d) **Internship:** PBPL 298I
2. **Elective Courses**
   Students are required to complete 5 courses from the selection below. Additional courses can be approved with the consent of the graduate advisor.
   PBPL 204, PBPL 206, PBPL 230F, PBPL 233, PBPL 234, PBPL 235, PBPL 236E, PBPL 245, PBPL 250, PBPL 252, PBPL 255, PBPL 260, PBPL 261, PBPL 262, PBPL 264, PBPL 265, PBPL 266, PBPL 270E, PBPL 270F, PBPL 272, PBPL 272, PBPL 273, PBPL 280, PBPL 290
3. **Capstone Research Project**
   Students must complete a capstone research project in the second year of the program.
   a) PBPL 289A, PBPL 289B Normative

Normative Time to Degree Two years

Lower-Division Courses

PBPL 001 Introduction to Public Policy Analysis 4 Lecture, 3 hours; discussion, 1 hour. Introduces the basic concepts and processes underlying policy analysis. Includes application of these concepts to economic and budgetary policy, health care policy, welfare and social security policy, education policy, and environmental and energy policy

PBPL 002 Politics and Public Policy 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the political institutions and processes that govern public policy in the United States and the tools and techniques used in public policy analysis. Part I presents policymaking models and methods of policy analysis. Part II applies these concepts to specific policy areas, illustrated by real-world case studies.

PBPL 004 Ethics, Professionalism, and Public Policy 4 Lecture, 3 hours; discussion, 1 hour. Examines extent to which issues of fairness, social justice, and morality should factor into the choice of public policies. Includes trade-off between social justice and efficiency; actors whose value perspectives often reflect public policy; ethical standards to which policy makers and practitioners are held; and professionalism in public service.

PBPL 006 Introduction to Public Health 4 Lecture, 3 hours; discussion, 1 hour. Introduces the field of public health as a multidisciplinary area of research and practice. Provides an appreciation of its approaches, goals, and history. Surveys its many conceptual and methodological tools for addressing a range of health issues.

PBPL 010 Introduction to Geographic Information Systems 4 Lecture, 3 hours; discussion, 1 hour. Provides an introduction to the fundamental concepts of Geographic Information Systems (GIS), Geographic Information Science (GIScience), and their application to public policy and social science research. Also covers the use of geographic data and software in public policy and related practice.

PBPL 050 Introduction to Public Policy Major and University 2 Lecture, 1 hour; written work, 3 hours. Prerequisite(s): none. Introduces the Public Policy major. Provides opportunities to engage with Public Policy faculty and advisors to learn about research and program requirements. Explores the structure, culture, and various support systems in place in the University. Addresses student success in the major. Graded Satisfactory (S) or No Credit (NC).

PBPL 090 Special Studies 1 to 3 Individual Study, 3 to 9 hours. Prerequisite(s): consent of program chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 8 units.

PBPL 100A Data Analysis For Public Policy 1 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PBPL 001 with a grade of C- or better, CS 009A with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Introduction to data input, output, and calculation of key summary statistics. Explores concepts of correlation, measurement, and the requirements for establishing causality. Covers regression analysis, the normal distribution, and the law of large numbers.

PBPL 100B Data Analysis For Public Policy 2 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): PBPL 100A with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Introduction to the concept of sampling uncertainty and hypothesis testing required to establish causal inference. Explores inclusion of control variables in a multiple regression framework and why data generated from natural experiments and randomized control trials are valuable to policy analysts.

PBPL 101 Research Methods and Public Policy 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): PBPL 001; restricted to class level standing of junior, or senior; or consent of instructor. Examines methods for conducting social science research to inform public policy debates. Concentrates on measurement, sampling, research design, causality, natural quasi-experiments, surveys, and qualitative analyses. Studies and debates pressing public policy issues of the time including transportation, crime, immigration, healthcare, poverty, inequality, social policy, environment, and natural resources.

PBPL 102 Borderline Immigration Policies and Community Change Processes 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces experiences of immigrants in the southwest borderland region of the U.S. Immigration history, trends, and legislation are critical components to the course. Examine immigration policy impact on economic and health indicators as well as the family system. Examine a range of change strategies used to empower the immigrant community.

PBPL 103 Economic Development Policy 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Provide a broad overview of theories and models of urban growth and economic development, as well as the strategies and practices in implementing different strategies. Identifies the challenges of developing regions, cities and communities that are economically dynamic, socially equitable and environmentally sustainable.

PBPL 105 Qualitative Research Methods and Public Policy 4 Lecture, 3 hours; individual study, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduces a variety of qualitative research methods used in social science and public policy. Examines various stages and techniques of qualitative methods including research design, ethics, participant observation, focus groups, interviewing, analysis, and fieldwork. Reveals utility of methods in public policy and gaining insight on complex social issues.

PBPL 110 Basics of Public Budgeting and Finance 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): PBPL 001 with a grade of C- or better; restricted to class level standing of junior, or senior. Covers the basics of public sector budgeting and financing, which are central to nearly every facet of public policy. Includes operating and capital budgets, the funding of budgets, personnel issues, analytical techniques, financial management, and effectively communicating data to stakeholders.

PBPL 121 Crime and Public Policies 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): PBPL 001 with a grade of C- or better; restricted to class level standing of junior, or senior. Reviews various crime and criminal-justice system topics, the problems that accompany them, and policies and practices that address them. Links practice and policy. Encourages analytical and strategic thinking about these issues and policies.

PBPL 127 Sociological Determinants of Health 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 5 hours; research, 3 hours. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better; or consent of instructor. Introduces the role that social factors play in shaping the occurrence and distribution of disease and death in populations with an emphasis on socioeconomic status, racism, social relationships and social stress. A particular emphasis is placed on sociological origins of health inequalities. Cross-listed with SOC 127.

PBPL 130 Management of International Water 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores basic concepts of international water law. Examines how these concepts, as well as conflict definitions, negotiation principles, and cooperation principles, are applied to international waters. Includes analysis of several major international water cases utilizing contemporary literature. Cross-listed with GBST 130.

PBPL 132 Water Economics, Management and Policy: California and Beyond 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Introduction to the complexities of water resource economics, management and policy in California, and comparison to other states and countries. Evaluates the California water sector, its problems, and approaches used to address them. Explores contemporary water issues and policy interventions that have been attempted, with resulting efficiency and equity.

PBPL 133 Cost Benefit Analysis For Public Policy 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): ECON 003 with a grade of C- or better; restricted to class level standing of junior, or senior. Provides the skills needed to be producers and critical consumers of Cost-Benefit Analysis (CBA). Studies the basic methodological tools needed to conduct a CBA. Engages with key conceptual issues related to risk and uncertainty, intergenerational discounting, inequality, and the value of human life.

PBPL 150 Urban Informatics For Public Policy 4 Lecture, 3 hours; research, 2 hours; term paper, 1 hour. Prerequisite(s): PBPL 010 with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Analyzes the spatial structure of cities for a range of socioeconomic issues such as demographic changes, affordable housing, and economic development. Utilizes up-to-date geographic information systems (GIS) techniques to gain hands-on learning experiences with the core theories in urban geography and their policy applications in both U.S. and international contexts.

PBPL 155 Women's Labor and the Economy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. A special-topics based labor economics course. Focuses on one important dimension of worker differences: gender. Covers the topics of human capital, wages and employment, occupational choice, discrimination, the family as an economic unit, and public policy. Cross-listed with ECON 155, and GSST 155.

PBPL 157 Labor in the Public Sector 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. A labor economics course on employment in the public sector. Explores questions of wages and contract structuring, recruitment, training, risk, collective bargaining, licensing, rent-seeking and corruption, and influence in the public sector. Cross-listed with ECON 157.

PBPL 160 Immigrant Health and Wellbeing 4 Lecture, 3 hours; individual study, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Introduction to community-engaged methods in health disparities research. Examines health disparities and social determinants of health and conducts in-depth examination of community engaged research methods. Provides theoretical principles, methods, and skills needed to plan and implement community-engaged research.

PBPL 162 Health in All Policies 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PBPL 001 with a grade of C- or better or SOC 001 with a grade of C- or better or SOC 001H with a grade of B or better; restricted to class level standing of junior, or senior. Explores social influences on health and the role that public policies play in shaping the social determinants of health. Examines the link between social circumstances (socioeconomics, race, ethnicity, environment) and health outcomes. Identifies connections and considers whether and to what extent public policy mitigates harmful influences or stimulates positive outcomes.

PBPL 164 Social Innovation in Theory and Practice 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Introduction to theories and practices associated with social innovation and public policy. Explores key concepts and debates in the field of social innovation including social entrepreneurship, systems approaches, and design thinking. Evaluates practices of social innovation through case studies and applications to policy and civic engagement.

PBPL 166 Intergovernmental Relations 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduction to American intergovernmental relations. Topics include federalism; fiscal federalism; national-state, interstate, state-local, and national-local relations; tribal governments; networks; and interstate relations. Examines current intergovernmental problems and formulates recommendations to policymakers.

PBPL 167 Medical Sociology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduces key concepts and theories in medical sociology and their application to a variety of health issues. Exemplar topics include social construction of health and illness, medicalization, stigma and labeling, patient-provider interaction, sociology of medical professionals, social determinants of health, and political economy of health. Cross-listed with SOC 167.

PBPL 170 Technology, Policy, and Ethics 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): upper-division standing. Provides contemporary perspectives on interplays between technology, public policy, and ethics. Covers social, legal, and ethical issues such as liability, as well as environmental, patent, and copyright law. Cross-listed with ENGR 170.

PBPL 171 Globalization 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Covers technological drivers of globalization. Includes social, economic, and political consequences. Explores the cultural aspects of globalization, including barriers and drivers for economic and cultural interdependence and integration. Also explores virtual global organizations. Cross-listed with ENGR 171, and NASC 171.

PBPL 172 Environmental Policy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): ECON 003 or ECON 003H; restricted to class level standing of junior, or senior. Provides overview of United States and California environmental policy. Examines economic and political justification for government intervention, different policy tools available to improve environmental quality, and the political, legal, and economic forces that determine policy outcomes. Reviews current environmental issues including climate change, air quality, water quality, and energy policy.

PBPL 177 Housing Policy 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): PBPL 001; restricted to class level standing of junior, or senior. Introduces affordable housing policies in the United States. Explores the key policy tools available to build, maintain, and preserve affordable housing. Draws on current social science research to evaluate the effectiveness of these programs and identify challenges to current policy.

PBPL 178 Urban Issues and Policy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Covers theories and explanations regarding urban struggles in contemporary times. Discusses forces and social structures

that influence cities and the experiences of urban dwellers. Encourages analytical and strategic thinking about these issues and discusses policies that ameliorate them. Considers the role policies play in contributing to and addressing urban problems. Credit is awarded for one of the following PBPL 178, PBPL 182, SOC 182, or URST 182.

PBPL 179 Public Policy and Digital Platforms 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Explores digital platforms such as Instagram, TikTok, and X and their rapid global user growth during the past few decades. Discusses the issues resulting from this boom including free speech, censorship, and online safety. Addresses the question of government's role in regulating digital platforms.

PBPL 180 Special Topics in Public Policy 4 Lecture, 3 hours; individual study, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Explores various topics of public policy within the instructor's area of specialization. Course is repeatable as content or topic changes to a maximum of 12 units.

PBPL 182 Urban Problems 4 Lecture, 3 hours; discussion, 1 hour; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. An interdisciplinary examination of selected urban problems such as civil disorders, transportation, housing, welfare, and planning. Cross-listed with SOC 182, and URST 182. Credit is awarded for one of the following PBPL 182, SOC 182, URST 182, or PBPL 178.

PBPL 184 Law and Justice 4 Lecture, 3 hours; written work, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Provides an overview of the criminal justice system. Covers the role of the District Attorney and the Public Defender's offices. Examines the judicial branch and modern-day courts. Discusses law enforcement's role along with the Probation Department and the Department of Mental Health. Analyzes the justice system reform.

PBPL 185 Race and Law Enforcement 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores the role of race and ethnicity in the historical and contemporary practice of United States law enforcement. Evaluates the study of race and policing to explore the evidence of racial bias in the application of police tactics and uncover evidence-based methods for reducing racial disparities in policing outcomes.

PBPL 186 Policy Evaluation in Development Economics 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): ECON 003 or ECON 003H; or consent of instructor. An overview of randomized impact evaluation as a tool of the causal revolution in development economics. Introduces experimental methods and covers the application of those methods to conducting impact evaluations in a range of development settings including education, health, labor, and economics of the firm, microfinance, environment, and political economy. Cross-listed with ECON 186.

PBPL 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): consent of program chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 15 units.

PBPL 191 Professional Engagement in Public Policy 2 Seminar, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Covers many aspects of professional career development in public policy including developing career goals; developing applications for fellowships, leadership, or internship opportunities; and building professional networks by attending public lectures on campus. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

PBPL 195H Senior Honors Thesis 1 to 4 Thesis, 3 to 12 hours. Prerequisite(s): senior standing in Public Policy; admission to University Honors or consent of instructor. Students complete research in public policy and write a senior honors thesis under the guidance of a faculty member. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 12 units.

PBPL 197 Research For Undergraduates 1 to 4 Consultation, 1 to 4 hours; research, 1 to 4 hours. Prerequisite(s): BUS 115 or PSYC 011 or SOC 005 or STAT 004 or STAT 008 or STAT 155. Examines community activities and legislative processes in the region and the state. Includes designing and shaping research to address community needs and objectives; planning and performing applied research using quantitative, qualitative, and mixed methods; and developing writing and oral communication skills. Course is repeatable to a maximum of 8 units.

PBPL 198I Individual Internship in Public Policy 1 to 12 Written Work, 1 to 12 hours; internship, 2 to 24 hours. Prerequisite(s): junior standing in Public Policy; consent of instructor. Internship in a public or quasi-public agency or business concern in matters relating to public policy. Course is repeatable to a maximum of 16 units.

Graduate Courses

PBPL 200 Introduction to Policy Analysis 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Studies the process by which policy decisions are made. Focuses on the analytical tools (benefit-cost, cost effectiveness, decision tree, and optimization analysis) that are used to choose among competing proposals as well as the analytical motivations for choice.

PBPL 202 Policy Institutions and Processes 4 Lecture, 3 hours; extra reading, 1 hour; research, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Explores the various institutions in a country that shape, formulate, implement, and enforce policy as well as the manner in which these institutions make or influence policy. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 204 Regional Policy-Making Across Administrative Jurisdictions 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Introduction to the analytical tools used in regional policy analysis as well as to the processes of policy development, implementation, and evaluation. Includes analysis of case studies of councils of government and other regional bodies that have emerged or been created to provide regional governance. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 205 Research Design and Statistics For Public Policy 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces research design and techniques for writing graduate-level research papers. Covers measurement, sampling, experimental and quasi-experimental designs, survey research and instrumentation, field research, and research using available data. Also introduces data processing, elementary statistics, and data visualization techniques. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 206 State Governments as Laboratories of Change 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Examines the politics, institutions, and policy processes of state governments and assesses the extent to which variation in state political institutions shapes politics and policies across states. Substantive topics include health care, education, corrections, economic development, land use planning, environmental protection, and social welfare. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 210 Quantitative Methods For Public Policy 1 4 Lecture, 3 hours; research, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduces statistical concepts and software with an emphasis on application. Covers correlation, bivariate and multivariate linear regression,

regression diagnostics, nonlinear and interaction effects, and regression analysis for categorical dependent variables. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 212 Qualitative Social Science Methods 4 Lecture, 3 hours; extra reading, 1.5 hours; research, 1.5 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces the qualitative methods widely used in the social sciences and their use in analyzing policy formulation, policy implementation, and policy effects. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 214 Applied Microeconomics For Public Policy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Shows how economic analysis impacts public policy issues. Identifies the relevant economic analyses to address various public policy problems and to comprehend and assess what professional economists can contribute to the shaping, implementation, and evaluation of public policies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 215 Economics For Policy Analysis 2 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers various market failures that justify government policy intervention; how economic analysis is used to measure impacts of policies; and how policy design can improve economic efficiency. Introduces policy issues confronting our society including access to health care, excess pollution, provision of public goods, education, social insurance, and taxation. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 216 Public Leadership and Management 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduction to the basic principles and practices of leadership suitable for local, regional, national, and global/international settings. Also assists in developing the capacity to be a public leader. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 220 Quantitative Methods For Public Policy 2 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces common statistical methods used to establish causality when evaluating policy impacts. Applies statistical techniques to current policy issues. Covers panel data, randomized control trials, matching methods and synthetic controls, difference in differences, instrumental variables, and regression discontinuity. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 222 Ethics, Professionalism, and the Normative Bases of Public Policies 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Examines the normative bases of public policies; in other words, the extent to which issues of fairness, social justice, and morality should factor into the choice of public policies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 224 Global-Local Policy Connections: Case Studies in Poverty, Water, and Sustainable Development 4 Lecture, 3 hours; extra reading, 1.5 hours; research, 1.5 hours. Prerequisite(s): graduate standing; or consent of instructor. Illustrates how the United States can learn from the successful policy experiences of other countries, and vice versa. Explores global experiences in four topical areas including poverty, environment, urbanism, and health. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 230 (E-Z) Topics in Health Policy 4 Prerequisite(s): graduate standing. Topics related to health policy. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 230F Public Policy and Health 4 Seminar, 3 hours; term paper, 1 hour; extra Reading, 1 hour; research, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Introduces multiple public policy domains - housing, environment, immigration and others - affect the health of populations. It follows that as public policy is the developed the health of populations is influenced. Students learn how public policy initiatives in multiple domains can be leveraged to improve population health. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 233 Environmental Economics and Policy 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Theory and practice of environmental economics and its application to environmental policymaking. Applies tools of economic theory to problems of managing natural resources and environmental quality, with particular emphasis on externalities, sustainability, pollution control, resource extraction, and environmental valuation. Alternative public policy instruments for environmental management are considered and evaluated. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Credit is awarded for one of the following PBPL 233 or ECON 226.

PBPL 234 Poverty in Global Perspective 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Interdisciplinary and international view of the social sciences of poverty. Topics include causes, consequences, and potential solutions to poverty. Compares different social science methodologies and theories. Evaluates and debates relevant social policies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 235 Economic Development in United States Cities 4 Lecture, 3 hours; extra reading, 1.5 hours; term paper, 1.5 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces theories and models of urban growth and economic development. Analyzes and evaluates the strategies and practices in implementing these theories and models. Examines the challenges of developing regions, cities, and communities that are economically dynamic, socially equitable, and environmentally sustainable. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 236 (E-Z) Urban and Spatial Analyses 4 Prerequisite(s): graduate standing. Topics related to urban and spatial analyses. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 236E United States Census Data and Policy Studies 4 Seminar, 3 hours; term paper, 1 hour; research, 1 hour; extra reading, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Addresses in depth the census data as the primary resource for analyzing local and regional changes, especially in urban settings. Substantive topics include, but not limited to, immigration, racial and ethnic change, employment, health, and poverty issues. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 245 Comparative Global Water Policy 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Covers issues and problems faced by developing and industrialized countries. Compares and analyzes the debate about efficiency vs. equity and protection of the environment, prices vs. quotas, water as a public good, economic good or social good, and adaptation in the water sector to climate change. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 246 Agricultural and Food Policy 4 Seminar, 3 hours; written work, 2 hours; extra reading, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Focuses on the application of economic principles and data analysis to analyze current public policy issues affecting U.S. and world food systems and agricultural sectors. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 250 Public Budgeting and Finance 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Addresses public budgeting and finance as critical components of public policy. Covers reading public financial documents; budget preparation and budget cycles; government and its relation to the economy, governmental revenues, and expenditures; capital budgeting; debt management; public accounting; financial reporting; and intergovernmental fiscal relations. May be taken Satisfactory (S) or No

Credit (NC) with consent of instructor and graduate advisor.

PBPL 252 Crime Mapping Analysis 4 Lecture, 3 hours; laboratory, 1 hour; research, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Covers crime mapping and crime analysis including the systematic application of geovisualization tools combined with statistical, geometric, and spatial analysis. Explores the distribution of criminal events in both space and time, the efficiency and efficacy of police services, and the interactions of offenders and targets.

PBPL 255 Mapping For the Common Good 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Provide a theoretical and technical understanding of maps, spatial data, and geovisualization. Highlights how geographic information technologies and spatial reasoning skills impact our understanding of the world. Explores how spatial data and mapping can develop strategies, plans, and policies to improve the quality of life for communities and their citizens. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 260 Education Policy Analysis 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Examines major issues and reform movements in public education that are at the forefront of the national policy agenda today. Views each educational reform issue in light of its connection to four themes driving reform efforts: (1) equity, (2) adequacy, (3) autonomy, and (4) accountability. Credit is awarded for one of the following PBPL 260 or EDUC 209.

PBPL 261 Higher Education Policy 4 Seminar, 3 hours; extra reading, 2 hours; research, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Provides an advanced introduction to higher education policy and policymaking. Begins with theories of power and how they relate to higher education policy. Examines process models of policy making. Considers five areas of higher education policymaking: science policy, competitiveness policy, student aid policy, access and completion policy, and accountability policy. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 262 Economics in Higher Education 4 Seminar, 3 hours; extra reading, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Examines the economics of higher education from two perspectives. First, it examines the debate on why college costs have escalated, how that affects access, and what might be done. Second, it looks inside universities, where their money comes from, the debate over budgeting systems, and means of managing costs internally. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 264 Methods in Health Disparities Research: An Introduction to Community Engaged Research 4 Seminar, 3 hours; individual study, 2 hours; term paper, 1 hour. Prerequisite(s): PBPL 230F or SOC 288; graduate standing; or consent of instructor. Introduction to community-engaged methods in health disparities research. Examines health disparities and social determinants of health and conducts in-depth examination of community-engaged research methods. Provides theoretical principles, methods, and skills needed to plan and implement community-engaged research.

PBPL 265 Advanced Methods in Health Disparities Research: An Application of Community Engaged Research 4 Lecture, 1 hour; research, 6 hours; term paper, 3 hours. Prerequisite(s): PBPL 264; graduate standing; or consent of instructor. Advanced course in the application of community-engaged methods in health disparities research. Provides students with hands-on experience to plan and implement community-engaged health disparities research as an independent scholar. Course is repeatable to a maximum of 12 units.

PBPL 266 Transportation Policy 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces transportation planning, finance, and policymaking focusing on policies and practices in the United States. Discusses the interaction of transportation, land use, pricing, finance, and project evaluation. Includes a discussion of transportation equity, transportation technology, and the intersection of transportation and public health. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 270 (E-Z) Topics in Immigration Policy 4 Prerequisite(s): graduate standing. Topics related to immigration policy. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 270E General Perspectives On Immigration Policy 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Introduction to a global and comparative perspective on immigration policy, with a special focus as it applies to the United States. Focus on debates over the political rights of immigrants, immigration enforcement, unauthorized migration, economic migration, family migration, refugee flows, citizenship, social integration, and political participation. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 270F Borderland Policies and Community Processes 4 Seminar, 3 hours; term paper, 1 hour; research, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces the experiences of immigrants in the southwest borderland region of the U.S. Explores immigration history, trends, and legislation. Examines the immigration policy impact on economic and health indicators as well as the family systems and dynamics. Attention to change strategies used to empower the immigrant community. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor

PBPL 271 Racial Inequality in Politics and Policy 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Politics and policy of race and social inequality in the United States. Topics include disparities in health, education, income, wealth and civic engagement. Students gain an understanding of the history of racial inequality, including its changes over time, and the efficacy of contemporary solutions to address ongoing racial disparities. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 272 Policy and Politics in California 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Introduction to politics and policy in California, paying particular attention to the nature of American federalism, institutions of state government, direct democracy, the role of partisanship and demographic diversity, and various problems of governance as they relate to issues at the state and local levels. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 273 Geographic Information Systems For Public Policy 4 Lecture, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to geographic information systems (GIS), spatial data and applications of spatial analysis in the social sciences and public policy. Theoretical, technical, and policy dimensions of GIS in policy settings. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 274 Social Innovation in Theory and Practice 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Introduces the theories and practices associated with social innovation and public policy. Explores key concepts and debates that include discussions about social entrepreneurship, systems approaches, and design thinking. Follows with practices of social innovation including case studies at varying levels and applications specific to public policy areas. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 280 Special Topics in Public Policy 4 Seminar, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Seminars or lectures on current topics in public policy and other related fields presented by faculty members. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content or topic changes.

PBPL 289A Capstone Research Project 4 Seminar, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Research and investigate a topic of policy

significance and relevance, producing a technical paper of publishable quality. Includes specific topic of investigation designed to foster integration of learning by incorporating knowledge acquired throughout the 2-year program. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Graded In Progress (IP) until PBPL 289A and PBPL 289B are completed, at which time a final grade is assigned.

PBPL 289B Capstone Research Project 4 Seminar, 4 hours. Prerequisite(s): PBPL 289A; graduate standing; consent of instructor. Research and investigate a topic of policy significance and relevance, producing a technical paper of publishable quality. Includes specific topic of investigation designed to foster integration of learning by incorporating knowledge acquired throughout the 2-year program. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

PBPL 290 Directed Studies 1 to 6 Activity, 3 to 18 hours. Prerequisite(s): graduate standing and consent of instructor. Advanced work in a topic or topics appropriate to the student's special interests and needs. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PBPL 291 Individual Study in Coordinated Areas 1 to 12 Activity, 3 to 36 hours. Prerequisite(s): graduate standing and consent of instructor. A program of study designed to advise and assist candidates who are preparing for masters and/or doctoral examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable

PBPL 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing and consent of instructor. Individual research performed under the direction of a faculty advisor. Designed for students preparing their capstone prospectuses. Students meet in groups by appointment with a faculty advisor to discuss issues of capstone writing. Emphasis is placed on the development of research design. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PBPL 298I Individual Internship 1 to 12 Internship, 2 to 24 hours; written work 1 to 12 hours. Prerequisite(s): graduate standing or consent of instructor. Internship in a public or quasi-public agency concerning matters relating to public policy. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

Public Policy Designated Emphasis

Subject abbreviation: PBPL
School of Public Policy

School of Public Policy
Mark Long, MPP, Ph.D., Dean

Bruce Babcock, Ph.D., Associate Dean
bruce.babcock.ucr.edu

Advisory Committee & Participating Faculty

Cecilia Ayon (Public Policy)
Ken Baerenklau (Public Policy)
Steve Brint (Sociology, Public Policy)
Richard Carpiano (Public Policy)
Robynn Cox (Public Policy)
Paul D'Anieri (Political Science, Public Policy)
Anil Deolalikar (Economics, Public Policy)
Kevin Esterling (Political Science, Public Policy)
Tony Grubesic (Public Policy)
Wei Kang (Public Policy)
Bruce Link (Public Policy)
Ronald Loveridge (Political Science)
Mehdi Nemati (Public Policy)
Ben Newman (Political Science, Public Policy)
Sharon Oselin (Public Policy, Sociology)
Kurt Schwabe (Public Policy)
Qingfang Wang (Public Policy)
Ran Wei (Public Policy)

Designated Emphasis Requirements

Students must complete four graduate courses (16 units) in total, of which two should be core courses in the Master of Public Policy program, one course from the list of MPP program elective courses, and one graduate course (from an approved list) offered by a department that is not the student's own department. Note that students cannot apply units taken to fulfill the DE program requirement toward their own graduate program requirements.

1. **Two (2) required core courses (8 units) offered by the School of Public Policy:** PBPL 200, PBPL 220.
2. **One (1) required elective course (4 units) offered by the School of Public Policy selected from:** PBPL 206, PBPL 210, PBPL 212, PBPL 214, PBPL 224, PBPL 230F, PBPL 233, PBPL 234, PBPL 241, PBPL 245, PBPL 252, PBPL 260/EDUC 209, PBPL 261, PBPL 262, PBPL 264, PBPL 265, PBPL 270E, PBPL 270F, PBPL 271, PBPL 272.
3. **One (1) required course from any of the following programs that is not the student's own graduate program:** ECON 236, ECON 237, ECON 240, ECON 241, ECON 243, ECON, 250, ECON 254, ECON 260, ECON 261, ECON 264, ECON 265, EDUC 203, EDUC 269M, EDUC 245G, EDUC 269E, CEE 232, ENGR 200, ENGR 201, ENGR 203, ENSC 201, ENSC 206, ENSC 227, GEO 205, GEO 252, GEO 255, GEO 260, POSC 252, POSC 268, POSC 271, POSC, 282, SOC 245, SOC 257, SOC 251, SOC 252, SOC 253
4. **Research Requirement:** Students in the Designated Emphasis are required to demonstrate their research capacity by writing a review paper that will focus on a policy issue/problem and the policy solutions (including design, implementation, and cost-effectiveness) to address the problem. Selection of the policy issue and the structure of the paper are to be agreed upon with a faculty member from the School of Public Policy, who will serve as a mentor, with an option for joint mentorship with a faculty member from another department (including the student's own department). It is expected that the review paper, of about 25-30 pages long, will be at a publishable quality to be completed within 1-2 quarters.

All requirements for the Designated Emphasis must be satisfied within a year of a student advancing to candidacy in their Ph.D. field; a minimum GPA of 3.0 is required for the award of the Designated Emphasis.

Robotics Program

The Marlan and Rosemary Bourns College of Engineering

Program Committee

Nael Abu-Ghazaleh, Ph.D. (Computer Science and Engineering)
Philip L. Brisk, Ph.D. (Computer Science and Engineering)
Yue Dong, Ph.D. (Computer Science and Engineering)
Ioannis Karamouzas, Ph.D. (Computer Science and Engineering)
Eamonn Keogh, Ph.D. (Computer Science and Engineering)
Evangelos Papalexakis, Ph.D. (Computer Science and Engineering)
Christian Shelton, Ph.D. (Computer Science and Engineering)
Greg Ver Steeg, Ph.D. (Computer Science and Engineering)
Salman Asif, Ph.D. (Electrical and Computer Engineering)
Matt Barth, Ph.D. (Electrical and Computer Engineering)
Bir Bhanu, Ph.D. (Electrical and Computer Engineering)
Jay Farrell, Ph.D. (Electrical and Computer Engineering)
Konstantinos Karydis, Ph.D. (Electrical and Computer Engineering)
Hyoseung Kim, Ph.D. (Electrical and Computer Engineering)
Cong Liu, Ph.D. (Electrical and Computer Engineering)
Jiachen Liu, Ph.D. (Electrical and Computer Engineering)
Hang Qiu, Ph.D. (Electrical and Computer Engineering)
Wei Ren, Ph.D. (Electrical and Computer Engineering)
Amit K. Roy-Chowdhury, Ph.D. (Electrical and Computer Engineering)
Vishwanath Saragadam, Ph.D. (Electrical and Computer Engineering)
Mingyu Cai, Ph.D. (Mechanical Engineering)
Erfan Nosari, Ph.D. (Mechanical Engineering)
Fabio Pasqualetti, Ph.D. (Mechanical Engineering)
Jonathan Realmuto, Ph.D. (Mechanical

Engineering)
Jun Sheng, Ph.D. (Mechanical Engineering)
Sundararajan Venkatadriagaram, Ph.D. (Mechanical Engineering)
Luat Vuong, Ph.D. (Mechanical Engineering)

Major

Robotics Engineering Undergraduate Major

Robotics studies the design, operation, and deployment of autonomous intelligent systems and mechanisms. Robotics is a fundamentally multidisciplinary field, with core components spanning engineering and computer science, and applications extending beyond science and technology. Courses in the B.S. in Robotics Engineering program focus both on the theory and the practice of contemporary robotics science and engineering, and prepare students for professional careers and graduate studies in robotics and beyond (e.g., autonomous systems, intelligent control systems, and decision making).

The B.S. in Robotics Engineering major is an interdepartmental program offered by the Marlan and Rosemary Bourns College of Engineering (BCOE), and involves the Departments of Mechanical Engineering, Electrical and Computer Engineering, and Computer Science and Engineering. Students are advised in and have their records maintained by the BCOE Office of Student Academic Affairs. Students must fulfill the breadth requirements of the Bourns College of Engineering.

University Requirements

See Undergraduate Students section.

College Requirements

For details on breath requirements, see the Colleges and Programs section of this catalog. Students are encouraged to consult their advisor regarding requirements.

Transfer Admission Criteria

Required:

1. Computer Science 10A (Intro to Computer Science for Science, Math, and Engineering I)
2. Computer Science 10B (Intro to Computer Science for Science, Math, and Engineering II)
3. Math 9A (First-Year Calculus), Math 9B (First-Year Calculus), Math 9C (First-Year Calculus)
4. Physics 40A (General Physics)

Required three courses from:

1. Computer Science 10C (Intro to Data Structures and Algorithms)
2. Computer Science 61 (Machine Organization and Assembly Language)
3. Electrical Engineering 5 (Circuits and Electronics)
4. Mechanical Engineering 9 (Engineering Graphics and Design)
5. Physics 40B (General Physics)
6. Physics 40C (General Physics)
7. Math 31/EE20B (Applied Linear Algebra)
8. Math 46/EE20A (Intro to Ordinary Differential Equations)

Major Requirements

1. **Lower-division requirements (72 units)**

a. MATH 009A or MATH 009AH; MATH 009B or MATH 009BH; MATH 009C

or MATH 009 CH; MATH10A; MATH 011; MATH 031; MATH 46.

b. PHYS 040A; PHYS 040B; PHYS 040C.

c. CS 010A; CS 010B; CS 010C; CS 061.

d. ME 009; ME 010.

e. EE 005.

2. **Upper-division requirements (65 units)**

   a. CS 100; CS 120B / EE 120B.

   b. ME 103; ME120; ME 145 / EE 145.

   c. EE 106; EE 111; EE 114; EE 120A / CS 120A; EE132; EE142 / CS 171; EE 144 /ME 144.

   d. Four courses (at least 16 units) from the following list, none of which can also be used to satisfy other major requirements: CS 111; CS 122A; CS 122B; CS 135; CS 141; CS 145; CS 150; CS 160; CS 170; CS 173; ME 110; ME 122; ME 130; ME 131; ME 133; ME 153; EE 100A; EE 115; EE 128; EE 141; EE 146; EE 147; EE 150; EE 151; EE 152; ENGR 160.

   e. One of the following two-course sequences: CS 178A and CS 178B, or EE 175A and EE 175B, or ME 175B and ME 175C.

Change of Major Criteria

All students who request a change of major to Robotics Engineering must meet the following requirements:

- Be in good academic standing
- Have no less than a C- in any Math,
- Science and Engineering coursework
- Be able to complete major within maximum allowable units.
- Complete all the courses listed below, based on the total number of units earned, prior to submitting the major change request
- UCR transfer students interested in changing to a BCOE major must have been admissible to the major at point of entry, or must satisfy transfer admission and change of major requirements before earning 120 units.
- If changing in the 90-119 units category, student must have the ability to complete major within 5 years of entry as a Freshmen or 3 years after entry as a Transfer student.
- Students who have earned 120 or more units are not eligible for a change of major in BCOE. NOTE: AP/IB units are excluded from maximum unit calculation.
- Any deviations will require approval of the Robotics Program Chair.

0 – 45 Units

Completion of ENGL 001A with C or better and completion of the following with at least a 3.0 GPA:

- MATH 009A
- MATH 009B
- CS 010A
- CS 010B
- PHYS 040A

46 – 89 Units

Completion of ENGL 001A with C or better and completion of the following with at least a 3.0 GPA:

- MATH 009A
- MATH 009B
- MATH 009C
- MATH/CS 011
- CS 010A
- CS 010B
- CS 010C
- PHYS 040A

90 – 119 Units

Completion of ENGL 001A with C or better and completion of the following with at least a 3.0 GPA:

- MATH 009A
- MATH 009B
- MATH 009C
- MATH/CS 011
- MATH 031
- MATH046
- CS 010A
- CS 010B
- CS 010C
- PHYS 040A
- PHYS 040B
- ME010

Graduate Program

The Robotics program offers the M.S. degree in Robotics after completion of the following requirements.

Master of Science in Robotics

Admission

All applicants to this program must have completed a Bachelor's degree or its approved equivalent from an accredited institution and to have attained undergraduate record that satisfies the standards established by the Graduate Division and University Graduate Council. Applicants should have at least an undergraduate major in Mechanical Engineering, Computer Engineering, Computer Science, Electrical Engineering or a closely related field. Applicants who fail to meet this criterion may sometimes be admitted with course deficiencies, provided they take remedial steps to cover the deficiencies.

A student who is deficient in a competency area may be asked to complete the corresponding UCR course with a letter grade of at least B, or to pass a challenge examination based on that course's final exam with a grade of at least B. All such remedial work should be completed within the first year of graduate study, and in all cases the deficiency(s) must be corrected BEFORE a student can enroll in any graduate course from the same specialty area. The details will be decided by the Graduate Advisor of the program in consultation with the student.

The Graduate Record Exam, General Test (GRE) is not required to apply for the M.S. Robotics program. Relevant GRE subject tests may be beneficial to the candidate's application, but are not required. Applicants whose first language is not English are required to submit

acceptable scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) unless they have a degree from an institution where English is the exclusive language of instruction. Additionally each applicant must submit letters of recommendation, as per the admission requirements. All other application requirements are specified in the graduate application.

The committee designing the program fully recognizes that students from ME, EE, CEN and CS have different undergraduate training. The program is designed so that all students who have completed their undergraduate degrees in these areas will be able to take these courses. The program also allows for a number of undergrad courses which can be taken to build the fundamentals necessary before the graduate course is taken.

Course Work
The MS in Robotics requires the completion of 40 units of coursework, including a capstone experience. Units are divided among core, focus area, and elective courses. A total of 12 units maximum can be at the undergraduate level, selected from the list of courses below. Colloquium units do not count towards the 40 units.

Core Courses:
Five courses for a total of 20 units are required. All students must complete the same core courses:

CS 224/EE242A – Foundations of Machine Learning

CS/EE 265A – Foundations of Robotics: Planning and Control

CS/EE 265B – Foundations of Robotics: Sensing and Navigation

ME 224 – Computational methods for robotics

ME 225 – Design and fabrication of robots

Focus Area Courses:
Three courses for a total of 12 units are required. Courses must belong to the same focus area, which is selected by the student from the four possible choices. At most, one focus course can be at the undergraduate level.

1. **Embodied AI and Machine Learning**
   CS 170, CS 171/EE142, CS 173, CS 205, CS 222, CS 277, CS/EE 228, CS 229/EE242B, CS 235, CS/EE 248, CS258/EE227, EE 146, EE 236, EE 241, EE 243, EE 244, EE 247, EE 250, EE 267, EE 268, EE 269, ME 202, ME 233
2. **Motion Planning and Autonomous Navigation**
   EE 132/ME 121, EE 144, EE 151, EE 231, EE 235, EE 236, EE 237, EE 238, EE 239, EE 246, EE 268, ME 145, ME 220, ME 221, ME 223
3. **Robot Design and System Integration**
   CS/EE 131, CS 135, CS256/EE258, EE 128, EE 217, EE 246, EE 252, EE 255, EE 258, EE 267, ME 174, ME 175B, ME 175C, ME 210, ME 230, ME 232, ME 233, ME 271

Elective Courses:
Students completing the comprehensive exam option will take two courses for a total of 8 units chosen from the options below. Students completing the project option will complete 8 units of CS, EE, or ME 297. Any courses not listed will require approval of the program graduate advisor.

1. course from the focus areas above that hasn't already been used.
2. ME 114, ME 118, ME 120, ME 130, ME 133, ME 153, ME 176, ME 200, ME 201, ME 203, ME 210, ME 231, ME 233, ME 270, ME 274
3. Any course listed in the EE Graduate Manual in the areas Signals, Systems and Machine Intelligence (SSMI) and VLSI Circuits and Systems (VCS).
4. Undergrad courses in the following undergrad EE focus areas are allowed: Communications, Signal Processing and Networking; Controls, Robotics and Machine Intelligence; and VLSI and Embedded Systems.
5. Any graduate CS course listed in the Catalog under the CS Graduate Program in the Major Specialty Areas of C (Databases, Information Retrieval, Data Mining, and Machine Learning), D (Operating Systems, Distributed Systems, and High Performance Computing), or E (Computer Networks).
6. Undergraduate CS courses CS170, CS 171, CS 172, CS 173.

Professional Development
All M.S. Robotics students must satisfactorily complete a colloquium course every quarter of their study, CS 287, EE 259, or ME 250. The inter- departmental nature of the Robotics program calls for students attending colloquia in multiple departments.

Additionally, students in the program must submit a Professional Development Report that details the students' efforts in developing their technical writing and presentation skills. This report should be submitted to and approved by the program Oversight Committee, as part of the Capstone experience. Specific guidance for this report will be provided by the committee to the students.

Capstone Experience (Plan II)
Students must complete a capstone experience that integrates knowledge from across their course of study by selecting one of the two options below:

a. **Comprehensive Exam Option** – Students take a comprehensive exam based on the courses in the program. The faculty committee overseeing the program will coordinate with the individual departments on the logistics of the exam.
b. **Project Option** – Students must complete a research project under the guidance of a faculty member. The project will be approved by a committee of at least two faculty members.
Normative Time – Six quarters (two years)

Society, Environment, and Health Equity

Subject abbreviation: SEHE
College of Humanities, Arts, and Social Sciences

Dana Simmons, Ph.D., Chair
@SEHE_UCR; sehe.ucr.edu

Professors
Juliann Emmons Allison, Ph.D., M.F.A.
Ellen Reese, Ph.D.
Catherine Gudis, Ph.D.
Bronwyn Leebaw, Ph.D.

Associate Professors
Cassia Roth, Ph.D., MPH
Dana Simmons, Ph.D.
Chikako Takeshita, Ph.D.
Jade, Sasser, Ph.D., MPH

Assistant Professors
Cristina Gomez Vidal, Ph.D., MSW

Majors

SEHE majors address complex social, medical, and environmental problems with a local and global focus on sustainability, equity, and social justice. Our interdisciplinary majors are grounded in the tools and concepts of the arts, humanities, and social sciences. Majors prepare undergraduate students for high-demand careers and post-graduate study in areas such as health care, health policy, and sustainability, serving the complex and diverse needs of the Inland Southern California region and beyond. Internships, work study, and fellowships, such as the UCR Bonnie Reiss Leading on Climate Fellowship, are available to students.

Environmental Studies Major

Through arts, humanities and social sciences education, this major equips students with knowledge, theory, and skills that advance their contribution to a world in which environmental degradation has become an increasingly significant subject of concern. To gain a deeper understanding of the complex interactions between the workings of human societies and ecological changes, the major engages a range of environmental challenges including climate change, air and water pollution, biodiversity loss, energy demands, toxic accumulations, waste management, deforestation and desertification, food security, and water scarcity as social phenomena, and examines how they intersect with broader societal issues such as environmental justice, policy and governance, history of colonialism, global capitalism, hunger and poverty, structural racism, gender inequality, health inequity, and community resilience. The major also introduces humanities approaches such as critical theory, environmental philosophy, regional history, storytelling, and other creative expressions to enrich students' intellectual relationships with nature and non-human elements. The major emphasizes community engagement as a necessary step in finding solutions for environmental challenges.

This interdisciplinary major will prepare students to make career choices that involve: promoting sustainable practices in various capacities as employees in public services, education, healthcare, or the private sector; joining nonprofit organizations with a focus on issues pertaining to environmental sustainability or social justice; and continuing their career development by pursuing professional and graduate education in sustainability, public policy, urban and regional planning, business, law, and public health. To learn more about the major, please consult this informational video: youtube.com/watch?v=icbAiAk19uc.

Global and Community Health Major

The major equips students with the knowledge, theory, and skills necessary to understand health disparities and promote the goal of health equity. Drawing on courses primarily in the arts, humanities and social sciences with an explicit framework of delivering health justice - fair and just health opportunities to everyone - this interdisciplinary field transcends traditional biomedical approaches to provide a historically-grounded, multi-level understanding of health and illness, systems of healing, and evidence-based solutions to global health inequities. Global and Community Health students learn to think critically about complex issues that affect health, healthcare, and health policy. The major investigates how political, economic, demographic, cultural, social, and biological factors interact to produce health (in)equities. The major prepares students for a wide range of careers and postgraduate study, including public service in healthcare, public health, social work, policy advocacy, consulting, research, and non-profit organizations focused on health and equity. Through in-depth, engaged learning experiences, the major nurtures community leaders and global citizens who can meet the global and community health challenges of the 21st century. To learn more about the major, please consult this informational video: youtube.com/watch?v=YQFL-97yaV8.

Students interested in pursuing a health profession (such as medicine, nursing, or public health) should consult the CHASS Pre-Health Pathway Checklist and meet with a Health Professions Advising Center advisor as early as possible.

Environmental Studies Major

Major Requirements (B.A.)

The major requirements for the general B.A. degree in Environmental Studies are as follows (52 units total):

1) **Lower-Division Requirement (4 courses, 16–17 units)**
   a) SEHE 001
   b) Two courses from the following list of courses in natural, earth, and environmental sciences or global community health. (Cannot double count with the CHASS math and science 20 unit requirement): BPSC 011, BPSC 021, ENSC 001, ENSC 002, ENSC 003, ENSC 004, ENSC 006/ECON 006, GEO 002, GEO 003, GEO 004, GEO 005, GEO 007, GEO 008, GEO 009 or GEO 009H, GEO 010, GEO 011 or GEO 011H, GEO 012, PHYS 018, SEHE 002
   c) One additional science course with a lab or STAT 004, SEHE 005/STAT 005 or equivalent (cannot double count with the CHASS 20 unit science and math requirement)

Comporable lower-division courses taken elsewhere may be counted toward the lower-division requirements (1a-c); up to four advanced placement units earned in high school may count toward fulfillment as well. Please consult with the academic advisors for further details.

2) **Upper-Division Requirements (9 courses, 36 units)**
   a) SEHE 101
   b) One of the following: GSST 171/SEHE 105, SEHE 106 or SEHE 106S
   c) Four courses selected from any of the following (i–v)
      i) **Climate Studies:** ENGR 171/NASC 171/PBPL 171, GSST 173/SEHE 141, SEHE 116, SEHE 131, SEHE 132
      ii) **Environmental Justice:** ETST 179, POSC 137/SEHE 137 or POSC 137S/SEHE 137S, SEHE 110, SEHE 135
      iii) **Environmental Governance:** ANTH 132, GSST 131, MCS 122, MCS 159, POSC 106/SEHE 136 or POSC 106S/SEHE 136S, POSC 127/SEHE 127 or POSC 127S/SEHE 127S, POSC 139/SEHE 139 or POSC 139S/SEHE 139S, SEHE 130, SEHE 131
      iv) **Environmental Humanities:** AST 180/JPN 180/MCS, 180, ENGL 120A, ENGL 120T, ETST 153, GSST 161/SEHE 123, GSST 181/SEHE 142, MCS 108, MCS 117, MCS 170, MCS 175/SEHE 143/SPN 125
      v) **Special Topics in Environmental Studies:** GSST 145/SEHE 145, GSST 148/SEHE 148, SEHE 159, SEHE 190
   d) One course in gender, race and structural inequities: ANTH 127 or ANTH 127S, ETST 102, ETST 111, ETST 113, ETST 163E, GSST 107, GSST 109, GSST 113, GSST 176, MCS 109, MCS 160, MCS 189, ETST 128/SOC 128, ETST 128S/SOC 128S, SEHE 176, SOC 161
   e) One additional SEHE course or an upper- division course from a college or school other than CHASS related to the environment, sustainability, or climate change
   f) Capstone: At least four units of SEHE 193, LABR 198G/SEHE 198G, or SEHE 198-I

Suggested course sequencing for four-year students:

First and second year: Complete SEHE 001 and lower-division major requirements (1.a, 1.b, and 1.c) in addition to the university and college requirements. Third year: SEHE 101; SEHE 105, SEHE 106 or SEHE 106S; two courses for requirement 2.c, and one for requirement 2.d. Fourth year: Two remaining courses requirements 2.c, one for 2.e., and a capstone course.

Suggested course sequencing for transfer students and students changing majors:

First year: SEHE 001 (must be completed before enrolling in SEHE 101), SEHE 101; SEHE 105, SEHE 106 or SEHE 106S; two courses for requirement 2.c. Second year: Two remaining courses for requirement 2.c., one for 2.d., one for 2.e., and a capstone course. Lower-division CNAS courses (requirements 1.b and 1.c) can be spread between the first and second year.

Environmental Studies Minor

Minor Requirements (20 units)

1) **Lower-division requirement (1 course, 4 units) SEHE 001**

2) **Upper-division requirement (4 courses, at least 16 units)**
   i) **Climate Studies:** GSST 173/SEHE 141, NASC 171/ENGR 171/PBPL 171, SEHE 116, SEHE 131, SEHE 132
   ii) **Environmental Justice:** ETST 179, GSST 171/SEHE 105, POSC 137/SEHE 137 or POSC 137S/SEHE 137S, SEHE 110, SEHE 106 or SEHE 106S, SEHE 129, SEHE 135
   iii) **Environmental Governance:** ANTH 132, GSST 131, MCS 122, MCS 159, POSC 106/SEHE 136 or POSC 106S/SEHE 136S, POSC 127/SEHE 127 or POSC 127S/SEHE 127S, POSC 139/SEHE 139 or POSC 139S/SEHE 139S, SEHE 130, SEHE 131
   iv) **Environmental Humanities:** AST 180/JPN 180/MCS, 180, ENGL 120A, ENGL 120T, ETST 153, GSST 161/SEHE 123, GSST 181/SEHE 142, MCS 108, MCS 117, MCS 170, MCS 175/SEHE 143/SPN 125
   v) **Special Topics in Environmental Studies:** GSST 145/SEHE 145, GSST 148/SEHE 148, SEHE 159

Global and Community Health Major

Major Requirements (B.A.)

1) **Lower-Division Requirement (4 courses, 16 units)**
   a) SEHE 002 Health Equity and Health Justice (4 units)
   b) One course in statistical analysis (4 units): SEHE 005/STAT 005, STAT 004 or equivalent
   c) One course (4 units) in natural science from the following: BCH 010, BIOL 030, BIOL 034, BIOL 040, BPSC 011, BPSC 021, BPSC 050/ENTM 050, CBNS 004, CBNS 010, CHEM 003, ENSC 001, ENSC 002, ENSC 004, GEO 003, GEO 004, GEO 007, PLPA 010
   d) One course (4 units) in global and/or local perspectives in health and/or environmental health, from the following: ANTH 20 or ANTH 20S, BLKS 001, ENGL 022, GBST 001, GBST 002, GSST013 or GSST013S, MHHS 001, PHIL 009 or PHIL 009H, POSC 017, SEHE 001, SFCS 001. An Upper Division course from 2(c) below may be used to fulfill this requirement.

Comparable lower-division courses taken elsewhere may be counted toward the lower- division requirements (1a-c); up to four advanced placement units earned in high school may count toward fulfillment as well. Please consult with the academic advisors for further details.

2) **Upper-Division Requirements (9 courses, 36 units)**

a) SEHE 101

b) One of the following core courses: GSST 171/SEHE 105, SEHE 106 or SEHE 106S

c) Four courses in global and community health from among the following. Must include at least two SEHE courses. ANTH 144F/GSST 185, ANTH 144I/SEHE 181, ANTH 144K/SEHE 182, ANTH 144N/SEHE 183, AST 180/JPN 180/MCS 180, ECON 129, ENSC 103, ETST 116/HISA 147, GBST 102, GBST 103, GSST 161/SEHE 123, GSST 164/SEHE 161, SEHE 175, MCS 106, MCS 117, PBPL 127/SOC 127, SOC 120, PBPL 167/SOC 167, PHIL 167, POSC 180, RLST 110, RLST 122, SEHE 110, SEHE 116, SEHE 129, SEHE 162, SEHE 163, SEHE 168/SOC 144, SEHE 170H/SOC 183H, SEHE 172, HIST 107/SEHE 173, SEHE 174, SEHE 176; SEHE 189, SEHE 190

d) One course in gender, race, and structural inequities from among the following: ANTH 127 or ANTH 127S, ANTH 142(E-Z), ETST 102, ETST 111, ETST 113/HISA 134, ETST 128/SOC 128, ETST 128S/SOC 128S, ETST 163E, GSST 107, GSST 109, GSST 113, GSST 131, GSST 176, MCS 109, MCS 160, MCS 189, SOC 161

e) One additional Upper Division course in SEHE

f) Capstone: At least four units of SEHE 193, LABR 198G/SEHE 198G or SEHE 198I

Suggested course sequencing for four-year students:

First and second year: Complete SEHE 002 and lower-division major requirements (1.a, 1.b, and 1.c) in addition to the university and college requirements. Third year: SEHE 101; SEHE 105, SEHE 106 or SEHE 106S; two courses for requirement 2.c; and one for requirement 2.d. Fourth year: Two remaining courses for requirement 2.c and a capstone course.

Suggested course sequencing for transfer students and students changing majors:

First year: SEHE 002 (must be completed before enrolling in SEHE 101), SEHE 101; SEHE 105, SEHE 106 or SEHE 106S; two courses for requirement 2.c. Second year: Two remaining courses for requirement 2.c., one for 2.d. and a capstone course. Lower-division requirements 1.b and 1.c can be spread between the first and second years.

Global and Community Health Minor

Minor Requirements

1) **Lower-division requirements (1 course, 4 units):**

SEHE 002 – Health Equity and Health Justice

2) **Upper-division requirements (4 courses, 16 units) from among the following:**

ANTH 144I/SEHE 181, GSST 161, GSST 164/SEHE 161, GSST 171/SEHE 105, SEHE 175, SEHE 101, SEHE 106 or SEHE 106S, SEHE 110, SEHE 116, SEHE 162, SEHE 163, SEHE 168/SOC 144, SEHE 170H/SOC 183H, SEHE 172, HIST 107/SEHE 173, SEHE 174, SEHE 176, SEHE 182/ANTH 144K, SEHE 183/ANTH 144N, SEHE 189

Lower-Division Courses

SEHE 001 Environment, Society, and Culture 4 Lecture, 3 hours; discussion, 1 hour; activity, 1 hour; extra reading, 1 hour. Introduces humanities and social sciences approaches in environmental studies to examine how society and human values affect the natural environment. Topics include agriculture and food security, biodiversity conservation, climate change, and deforestation. Introduces the role of race, class, and gender in shaping environmental burdens, benefits, and activism. Offered online only.

SEHE 002 Introduction to Health Equity and Health Justice 4 Lecture, 3 hours; discussion, 1 hour. Introduces theories and methodologies for the study of community health as well as global and local health inequities. Identifies health disparities trends, patterns, and causes in the United States and globally including historical, social, and structural factors. Considers policies and interventions addressing health disparities including community-engaged research. Offered online only.

SEHE 005 Statistics, Health, and Society 4 Lecture, 3 hours; discussion, 1 hour. An introduction to statistics using social, health, and environmental applications. Topics include descriptive statistics; simple linear regression and correlation; probability; discrete and continuous distributions; confidence intervals; hypothesis testing; and one-way analysis of variance. Cross-listed with STAT 005. Credit is awarded for one of the following SEHE 005, STAT 005, or STAT 004. Credit is not awarded for STAT 005 or SEHE 005 if already awarded to STAT 008, STAT 010, or STAT 011

Upper-Division Courses

SEHE 101 Community Research Methods: An Anti-Oppressive Toolkit 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SEHE 001 or SEHE 002; or consent of instructor. Addresses research design, research ethics, data collection and management, and public engagement. Reviews and practices disciplinary methods including social science, ethnography, history, critical reading, science and technology studies, statistical analysis, and feminist and critical race theories.

SEHE 105 Environmental Health and Social Justice 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S; GSST 020 or GSST 020H or GSST 020S or GSST 021; or consent of instructor. An interdisciplinary examination of the relationship between environmental health and social justice emphasizing gender, race, class, and globalization as analytical lenses. Topics include urban pollution, workplace exposure, industrial catastrophe, invisible environmental hazards, community activism, reproductive health, global capitalism, and new health challenges imposed by climate change. Cross-listed with GSST 171.

SEHE 106 Movements and Advocacy For Social Change in Environmental Justice and Health Equity 4 Lecture, 3 hours; research, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An overview of contemporary, comparative, and historical research on social and political movements. Includes legal and policy advocacy, health equity, sustainability, and environmental justice. Examines the motivations, visions, and contexts shaping these movements. Also examines movement and advocacy outcomes, challenges, and opportunities for promoting health equity and environmental justice. Credit is awarded for one of the following SEHE 106 or SEHE 106S.

SEHE 106S Movements and Advocacy For Social Change in Environmental Justice and Health Equity 5 Lecture, 3 hours; discussion, 1 hour; individual study, 1 hour; research, 1 hour; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An overview of contemporary, comparative, and historical research on social and political movements. Includes legal and policy advocacy, health equity, sustainability, and environmental justice. Examines the motivations, visions, and contexts shaping these movements. Also examines movement and advocacy outcomes, challenges, and opportunities for promoting health equity and environmental justice. Credit is awarded for one of the following SEHE 106S or SEHE 106.

SEHE 110 Environmental Health and Activism in Southern California 4 Lecture, 3 hours; research, 1 hour; extra reading, 1 hour; activity, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Interdisciplinary cross-examination of environmental challenges,

social inequities, human health consequences, and environmental justice activisms focusing on Southern California. Investigates the historical contribution of regional industrial developments and racial stratification to poor environmental health. Examines the spatial distribution of environmental and health burdens using California's mapping and indexing tools.

SEHE 115 Ethnography: Collaborative/ Activist Interdisciplinary Research 4 Lecture, 3 hours; research, 2 hours; written work, 1 hour. Prerequisite(s): GBST 001; or consent of instructor. Explores the ethnographic methodologies that are the interdisciplinary tools researchers use to describe and document everyday lived lives. Engages through various practicum and independent research utilizing literary sources. Includes composition of a research proposal and video presentation of independent findings. Cross-listed with GBST 115.

SEHE 116 Intersectionality, Climate Emotions, and Mental Health 4 Lecture, 3 hours; extra reading, 1 hour; written work, 1 hour; research, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduces emotional responses to climate change. Identifies the relationships between emotions and mental health outcomes. Explores the roles of race, gender, age, and social marginalization.

SEHE 123 Gender and Science 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Focuses on the intersections of Western constructions of gender and scientific knowledge since the sixteenth century. Considers the cultural and political roles of the scientist in terms of gender; the structuring of objectivity and objects of study; the status of scientific knowledge; and the emergence of feminist science studies. Cross-listed with GSST 161. Credit is awarded for one of the following GSST 161, SEHE 123, GSST 161S, or SEHE 123S.

SEHE 123S Gender and Science 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Focuses on the intersections of Western constructions of gender and scientific knowledge since the sixteenth century. Considers the cultural and political roles of the scientist in terms of gender; the structuring of objectivity and objects of study; the status of scientific knowledge; and the emergence of feminist science studies. Cross-listed with GSST 161S. Credit is awarded for one of the following GSST 161S, SEHE 123S, GSST 161, or SEHE 123.

SEHE 127 Global Environmental Politics 4 Lecture, 3 hours; field, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): POSC 020 or POSC 020H. Introduces the study and practice of global environmental politics. Explores major developments in the evolution of international environmental law and policy. Covers ozone depletion, acid rain, marine pollution and whaling, tropical deforestation, overpopulation, and the impact of environmental degradation. Cross-listed with POSC 127. Credit is awarded for one of the following POSC 127, SEHE 127, POSC 127S, or SEHE 127S.

SEHE 127S Global Environmental Politics 5 Lecture, 3 hours; discussion, 1 hour; field, 1 hour; individual study, 1 hour; written work, 1 hour. Prerequisite(s): POSC 020 or POSC 020H. Introduces the study and practice of global environmental politics. Explores the major developments in the evolution of international environmental law and policy. Covers ozone depletion, acid rain, marine pollution and whaling, tropical deforestation, overpopulation, and the impact of environmental degradation. Cross-listed with POSC 127S. Credit is awarded for one of the following POSC 127S, SEHE 127S, or POSC 127.

SEHE 129 Food Justice 4 Lecture, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores relations of power, love, desire, hunger, and taste through food and food systems. Considers how food is found, grown, made, bought, sold, shared, and consumed. Covers food apartheid and carceral food systems; metabolic disease; nutrition and nourishment; the right to food; and movements to decolonize food systems.

SEHE 130 Environmental Planning & Management 4 Lecture, 3 hours; activity, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduces environmental policy and regulation and environmental analysis of issues. Includes conservation, air quality, water quality and access, waste management, disaster planning, risk assessment, and environmental justice.

SEHE 131 Global Climate Politics & Policy 4 Lecture, 3 hours; activity, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores global climate policies in relation to the Global Climate Politics Framework Convention on Climate Change (UNFCCC). Addresses the critique of neoliberal climate policies, the politics of climate justice, and low carbon challenges and opportunities.

SEHE 132 Community Resilience to Climate Change 4 Lecture, 3 hours; activity, 1 hour; research, 1 hour; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduction to the theory and practices of climate resilience in rural and urban settings around the globe. Examines strategies for assessing climate resilience in different communities and building socially just action plans.

SEHE 133 Mindfulness, Climate Action, and Resilience 4 Lecture, 3 hours; activity, 1 hour; written work, 2 hours; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Develops personal and social skills to respond to the climate crisis and interrelated global crises the (polycrisis). Reviews climate science and introduces the polycrisis concept. Develops mindfulness and other contemplative practices. Explores strategies for effective climate communication and action to navigate and build a meaningful future. Cross-listed with GBST 133.

SEHE 135 Environmental War Crimes 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores when environmental destruction is considered to be a crime of war. Examines how people work to expose hazards, threats, and hidden burdens associated with environmental legacies of war. Addresses how communities pursue ecological recovery in connection with projects that are established to facilitate peacebuilding, reparations, and transformative justice. Credit is awarded for one of the following SEHE 135 or SEHE 135S.

SEHE 135S Environmental War Crimes 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores when environmental destruction is considered to be a crime of war. Examines how people work to expose hazards, threats, and hidden burdens associated with environmental legacies of war. Addresses how communities pursue ecological recovery in connection with projects that are established to facilitate peacebuilding, reparations, and transformative justice. Credit is awarded for one of the following SEHE 135S or SEHE 135.

SEHE 136 Environmental Political Thought 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Addresses various philosophical aspects of the human relationship to the environment from social, political, and economic perspectives. Includes debates related to issues such as how should human beings interact with their environment, as well as the relationship of environmental practice to liberalism, democracy, and capitalism. Cross-listed with POSC 106. Credit is awarded for one of the following POSC 106, SEHE 136, POSC 106S, or SEHE 136S.

SEHE 136S Environmental Political Thought 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Addresses various philosophical aspects of the human relationship to the environment from social, political, and economic perspectives. Includes debates related to issues such as how should human beings interact with their environment, as well as the relationship of environmental practice to liberalism, democracy, and capitalism. Cross-listed with POSC 106S. Credit is awarded for one of the following POSC 106S, SEHE 136S, POSC 106, or SEHE 136.

SEHE 137 Environmental Justice and Human Rights 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines how notions of justice and human rights have been brought to bear on environmental and sustainability debates. Also examines the theoretical and historical basis of the environmental justice and human rights movements. Topics include local concerns (including "food deserts") and air pollution, as well as global problems. Cross-listed with POSC 137. Credit is awarded for one of the following POSC 137, SEHE 137, POSC 137S, or SEHE 137S.

SEHE 137S Environmental Justice and Human Rights 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines how notions of justice and human rights have been brought to bear on environmental and sustainability debates. Also examines the theoretical and historical basis of the environmental justice and human rights movements. Topics include local concerns (including "food deserts") and air pollution, as well as global problems. Cross-listed with POSC 137S. Credit is awarded for one of the following POSC 137S, SEHE 137S, POSC 137, or SEHE 137.

SEHE 139 Environment, Sustainability, and Society 4 Lecture, 3 hours; individual study, 2 hours; written work, 1 hour. Prerequisite(s): POSC 017 or POSC 020 or POSC 020H or SOC 020; or consent of instructor. Examines the relationship of human society to the natural environment from a multi disciplinary approach. Considers ways in which values, paradigms, policies, technologies, and their interactions have determined humans' current unsustainable relationship with the earth. Explores challenges inherent in moving society toward a more environmentally sustainable future. Cross-listed with POSC 139. Credit is awarded for one of the following POSC 139, SEHE 139, POSC 139S, or SEHE 139S.

SEHE 139S Environment, Sustainability, and Society 5 Lecture, 3 hours; discussion, 1 hour; individual study, 2 hours; written work, 1 hour. Prerequisite(s): POSC 017 or POSC 020 or POSC 020H or SOC 020; or consent of instructor. Examines the relationship of human society to the natural environment from a multi disciplinary approach. Considers the ways in which values, paradigms, policies, technologies, and their interactions have determined humans' current unsustainable relationship with the earth. Explores challenges inherent in moving society toward a more environmentally sustainable future. Cross-listed with POSC 139S. Credit is awarded for one of the following POSC 139S, SEHE 139S, POSC 139, or SEHE 139.

SEHE 141 Gender and Climate Change 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S; GSST 020 or GSST 020H or GSST 020S or GSST 021. Examines the global social impacts of climate change that are magnified based on existing inequalities. Focuses on the disparity between men and women in their vulnerability and ability to cope with the global phenomenon. Investigates both women as "victims" of global warming and their positive roles in climate change mitigation. Cross-listed with GSST 173.

SEHE 142 Feminisms and Environmentalisms 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S; GSST 020 or GSST 020H or GSST 020S or GSST 021. Explores women's and feminist involvement in environmental movements. Examines how gender shapes our relationships with and approaches to environmental problems in the United States and globally. Investigates intersections between feminist concerns (health, reproduction, mothering, gender equity, and social justice) and environmental issues (conservation, pollution and global warming, and sustainability). Cross-listed with GSST 181.

SEHE 143 Human and Nonhuman: Decolonial and Audiovisual Perspectives On Life On A Diminished Planet 4 Seminar, 3 hours; screening, 2 hours; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. A study of decolonial and audiovisual approaches to conceiving the human/nonhuman from Latin American perspectives. Examines issues of extractivism, environmental justice, the debate on living well, the relation between human and nonhuman, and how films illustrate these issues. Cross-listed with MCS 175, and SPN 175.

SEHE 144 Modern U.s. Consumer Culture 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the history of mass consumer culture in the United States. Includes the shift from mass production to mass consumption; the grown in advertising and marketing; relationships of race and gender to the market; impacts on built and natural environment; rise of logistics; and waste. Cross-listed with HISA 119. Credit is awarded for one of the following HISA 119, SEHE 144, HISA 119S, or SEHE 144S.

SEHE 144S Modern U.s. Consumer Culture 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the history of mass consumer culture in the United States. Includes the shift from mass production to mass consumption; the grown in advertising and marketing; relationships of race and gender to the market; impacts on built and natural environment; rise of logistics; and waste. Cross-listed with HISA 119S. Credit is awarded for one of the following HISA 119S, SEHE 144S, HISA 119, or SEHE 144.

SEHE 145 Intersectionality, Ecology, and Community Design 4 Lecture, 3 hours; extra reading, 2 hours; research, 4 hours. Prerequisite(s): GSST 021. Introduces theoretical underpinnings of ecological utopias and ecotopias. Examines practical aspects of designing these intentional communities focused on sustainability. Includes discussion and critique of proposed ecotopias, analysis of egalitarian economic systems, inclusive and participatory political institutions, and social mores adopted by existing ecovillages and other sustainable intentional communities. Cross-listed with GSST 145.

SEHE 148 Intersectionality, Ecology, and Design Science 4 Lecture, 3 hours; practicum, 3 hours; extra reading, 2 hours; field, 2 hours; written work, 2 hours. Prerequisite(s): GSST 145, may be taken concurrently. Introduces regenerative design. Emphasizes stability and resiliency of natural systems and intersectional praxis of environmental justice in agricultural and social design. Recognizes sustainable food, water, and shelter requires understanding structures of power that shape and maintain discrimination. Includes agroecology; climate; health; permaculture; intentional communities; social activism; and sustainability. Cross-listed with GSST 148.

SEHE 159 Special Topics in Environmental Studies 4 Lecture, 3 hours; individual study, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores specific topics in Environmental Studies. Course content varies and is announced as the course is offered. Course is repeatable as content or topic changes to a maximum of 8 units.

SEHE 161 Reproductive Justice 4 Lecture, 3 hours; research, 1 hour; individual study, 3 hours; written work, 2 hours; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Introduces reproductive justice concepts of intersectionality, systemic oppression, the triple pillar approach, and human rights. Analyzes inequality and power in shaping the reproductive contexts of people's lives, behaviors, and outcomes. Cross-listed with GSST 164.

SEHE 162 Giving Birth 4 Lecture, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines maternal care in the U.S. and worldwide. Analyzes childbirth as a social practice and a cultural construction. Topics include maternal mortality and morbidity, childbirth in different cultures, medicalization of childbirth, alternative and natural birth movements, media representations of childbirth, birth stories, and attitudes toward cesarean section.

SEHE 163 Globalizing Roe: the Past, Present, and Future of Abortion Worldwide 4 Lecture, 3 hours; extra reading, 1 hour; written work, 1 hour; research, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Surveys the modern history of abortion policy and provision from legal, medical, religious, and public health perspectives. Centers the lived experiences of different individuals in their need to access abortion from a global lens.

SEHE 168 Interpersonal Relationship Violence 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better; SOC 004 with a grade of C- or better; SOC 005 with a grade of C- or better; or consent of instructor. Addresses causes, identification, and prevention of and responses to interpersonal relationship violence, such as family violence and partner violence. Examines theories and research findings for practical field application. Promotes better understanding of this common social problem and prepares for careers involving contact with victims and/or perpetrators of relationship violence. Cross-listed with SOC 144.

SEHE 170H Aging in America 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores special topics in sociology. Segment H may be offered online or in-person. H. Aging In America; M. Geographic Inform Sysms & Mapping In Soc & Other Social Sciences: principles, Techniques, & Research; P. Poverty And Welfare; W. Social Mobility. Cross-listed with SEHE 170 (E-Z), and SOC 183 (E-Z).

SEHE 170M Geographic Inform Sysms & Mapping in Soc & Other Social Sciences:principles, Techniques, & Research 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores special topics in sociology. Segment H may be offered online or in-person. H. Aging In America; M. Geographic Inform Sysms & Mapping In Soc & Other Social Sciences: principles, Techniques, & Research; P. Poverty And Welfare; W. Social Mobility. Cross-listed with SEHE 170 (E-Z), and SOC 183 (E-Z).

SEHE 170P Poverty and Welfare 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores special topics in sociology. Segment H may be offered online or in-person. H. Aging In America; M. Geographic Inform Sysms & Mapping In Soc & Other Social Sciences: principles, Techniques, & Research; P. Poverty And Welfare; W. Social Mobility. Cross-listed with SEHE 170 (E-Z), and SOC 183 (E-Z).

SEHE 170W Social Mobility 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores special topics in sociology. Segment H may be offered online or in-person. H. Aging In America; M. Geographic Inform Sysms & Mapping In Soc & Other Social Sciences: principles, Techniques,& Research; P. Poverty And Welfare; W. Social Mobility. Cross-listed with SEHE 170 (E-Z), and SOC 183 (E-Z).

SEHE 172 Public Health: Then and Now 4 Lecture, 3 hours; research, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Surveys the modern history of societal attempts to protect the health of human populations. Focuses on the lived experiences of individuals and cultures in the development of public health globally.

SEHE 173 Disease and Society 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Covers a world history of disease and how it relates to cultural shocks, environmental change, and survival. Evaluates the complex and reciprocal relationship between illness and society, and the historical dynamics around power, race, gender, and class which define disease and shape life chances, medicine and health. Cross-listed with HIST 107.

SEHE 174 Eugenics, Disability and Social Justice 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the intersections of race, disability, and the history and legacy of eugenics. Explores how theories of hereditary fitness shaped categories and experiences of disability, citizenship, reproduction, and race.

SEHE 175 Transforming Toxic Jobs: Health and Work in the United States 4 Lecture, 3 hours; research, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines research on health and work including occupational health; how work and employment impact health outcomes and health care; work experiences of health care providers; and the role of policies and organized efforts by workers, their allies, and clients to improve health and well-being at work and in the community. Cross-listed with LABR 175.

SEHE 176 Race, Gender, and Health: Diasporic Perspectives 4 Lecture, 3 hours; research, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Surveys ways in which historical legacies of slavery and racialization affect the health of racialized peoples from a diasporic perspective. Focuses on (but not limited to) the African diaspora in the Americas. Offered online only.

SEHE 181 Anthropology of Human Immunodeficiency Virus (hiv) 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A cross-cultural examination of the global Human Immunodeficiency Virus (HIV) epidemic from an anthropological perspective. Cross-listed with ANTH 144I.

SEHE 182 Drugs and Culture 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. A cross-cultural examination of drug use and its relation to race, class, gender, morality, laws, and health policy. Cross-listed with ANTH 144K.

SEHE 183 Anthropology of Global Health 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the overlaps, debates, and potential of medical anthropology to address contemporary issues in global health. Focuses on how the historical development, theoretical frameworks, methodological approaches, and ethical debates within medical anthropology can contribute to a just and inclusive version of global health. Cross-listed with ANTH 144N.

SEHE 189 Special Topics in Global and Community Health 4 Lecture, 3 hours; individual study, 1 hour; extra reading, 1 hour; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores specific topics in Global and Community Health. Topics are announced in the Schedule of Classes. Course is repeatable as content or topic changes to a maximum of 8 units.

SEHE 190 Special Studies 1 to 5 Consultation, 1 hour; activity, 2 to 15 hours. Prerequisite(s): restricted to class level standing of junior, or senior; and consent of instructor. Individual study directed by a faculty member to meet special curricular needs. Course is repeatable to a maximum of 15 units.

SEHE 193 Capstone in Society, Environment & Health Equity 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): SEHE 101; restricted to class level standing of junior, or senior; or consent of instructor. Completion of a capstone project that synthesizes and integrates the knowledge and skills obtained throughout the program. Develops skills in the formulation of research questions on topics in Society, Environment, and Health Equity, the use of primary or secondary data, and theory. Course is repeatable to a maximum of 8 units.

SEHE 197 Research For Undergraduates 1 to 4 Seminar, 1 hour; research, 3 to 12 hours. Prerequisite(s): restricted to class level standing of junior, or senior; and consent of instructor. Provides letter grade for written term paper or oral presentation; otherwise, provides only Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 12 units.

SEHE 198G Group Internship in Labor Studies and Society, Environment, and Health Equity 4 Seminar, 3 hours; internship, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): LABR 001 or SEHE 001 or SEHE 002 or SEHE 002S; restricted to major(s) Environmental Studies, Global and Community Health, Labor Studies; completion of internship activities for 3 hours per week before enrollment; and consent of instructor. Examines strategies for organizing and advocating for environmental justice and health equity within working class communities generally and within the Inland Empire. Provides hands-on professional experiences with community organizations related to environment and/or health justice. Critically reflects on internship experiences through course readings, in-class discussions, writing assignments, and oral presentations. Course is repeatable to a maximum of 16 units. Cross-listed with LABR 198G.

SEHE 198I Individual Internship in Society, Environment, and Health Equity 1 to 12 Research, 1 to 12 hours; internship, 2 to 24 hours. Prerequisite(s): restricted to class level standing of junior, or senior; and consent of instructor. An individual internship in a community or professional organization in matters relating to environmental studies and/or global and community health to gain professional experience and skills. Course is repeatable to a maximum of 12 units.

Sociology

Subject abbreviation: SOC
College of Humanities, Arts, and Social Sciences

Rob Clark, Ph.D., Chair
Office: 2144 Watkins Hall
(951) 827-6972; sociology.ucr.edu

Professors

Steven G. Brint, Ph.D. *Distinguished Professor*
Rob Clark, Ph.D.
Amy Kroska, Ph.D.
Bruce G. Link, Ph.D. *Distinguished Professor* (Sociology/Public Policy)
Matthew C. Mahutga, Ph.D.
Sharon Oselin, Ph.D. (Sociology/Public Policy)
Jan E. Stets, Ph.D. *Distinguished Professor*
Wei Zhao, Ph.D.
Tanya Nieri, Ph.D.

Associate Professors

Chioun Lee, Ph.D.

Professors Emeriti

Edna M. Bonacich, Ph.D. (Ethnic Studies/Sociology)
Peter J. Burke, Ph.D., *Distinguished Professor*
Christopher Chase-Dunn, Ph.D. *Distinguished Professor*
Randall Collins, Ph.D.
Scott L. Coltrane, Ph.D.
Robert A. Hanneman, Ph.D.
Alexandra Maryanski, Ph.D.
Alfredo Mirandé, Ph.D., *Distinguished Professor* (Ethnic Studies/Sociology)
Robert Nash Parker, Ph.D.
Karen D. Pyke, Ph.D.
Raymond L. Russell, III, Ph.D.
Linda Brewster Stearns, Ph.D.
David A. Swanson, Ph.D., *Distinguished Professor*
Jonathan H. Turner, Ph.D., *University and Distinguished Professor*
Kirk Williams, Ph.D.

Majors

Sociology is the scientific study of human behavior, interaction and organization. It provides a historical and comparative perspective on human societies and offers a framework for understanding society and the complex social world.

Students majoring in sociology can choose between a B.A. or B.S. degree. The department also offers majors in Sociology/Administrative Studies, and Sociology/Law and Society; as well as a minor in sociology. All students must meet quarterly prior to course enrollment with the student affairs officer or the undergraduate advisor to develop a program of studies.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

Sociology Major

The major requirements for the B.A. and B.S. degrees in Sociology are as follows:

For the Bachelor of Arts

Sociology Department requirements (14 courses [at least 56 units])

Students will not be admitted into the major until lower-division requirements are satisfied. All courses in the major must be taken for a letter grade.

1. **Lower-division requirements (5 courses [at least 20 units])**
   a) SOC 001 or SOC 001H with a grade of "C-" or better
   b) SOC 003, SOC 004, SOC 005 with a grade of "C-" or better in each
   c) One additional lower-division Sociology courses with a grade of "C-" or better
2. **Upper-division requirements (9 courses [at least 36 units])**
   a) SOC 168 or SOC 169
   b) A minimum of one course each selected from four of the following five areas of emphasis:
      (1) **Social Institutions, Organizations and Change:** SOC 112, SOC 121, SOC 122, SOC 123, SOC 125, SOC 137, SOC 139/MCS 139, SOC 143/URST 143, SOC 150, SOC 151, SOC 156, SOC 160, SOC 176/BUS 176, SOC 179, SOC 181, SOC 182/URST 182, SOC 184
      (2) **Social Psychology:** SOC 173, SOC 174, SOC 175, SOC 177 E-Z, SOC 178, SOC 186E, SOC 186F, SOC 186G
      (3) **Social Inequality:** SOC 128, SOC 129, SOC 130, SOC 131 E-Z, SOC 132, SOC 133, SOC 135, SOC 161, SOC 162, SOC 163, SOC 164, SOC 165
      (4) **Criminology and Deviance:** SOC 134, SOC 144, SOC 145, SOC 147, SOC 149, SOC 159, SOC 180
      (5) **Family and Gender:** SOC 140, SOC 141, SOC 142, SOC 146, SOC 155 E-Z
   c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

For the Bachelor of Science

Sociology Department requirements (16 courses [at least 64 units])

Students will not be admitted into the major until lower-division requirements are satisfied. All courses in the major must be taken for a letter grade.

1. **Lower-division requirements (5 courses [at least 20 units])**
   a) SOC 001 or SOC 001H with a grade of "C-" or better
   b) SOC 003, SOC 004, SOC 005 with a grade of "C-" or better in each
   c) One additional lower-division Sociology courses with a grade of "C-" or better
2. **Upper-division requirements (11 courses [at least 44 units])**
   a) SOC 110, SOC 168, SOC 169
   b) A minimum of one course each selected from four of the following five areas of emphasis:
      (1) **Social Institutions, Organizations and Change:** SOC 112, SOC 121, SOC 122, SOC 123, SOC 125, SOC 126, SOC 137, SOC 139/MCS 139, SOC 143/URST 143, SOC 150, SOC 151, SOC 156, SOC 160, SOC176/BUS 176, SOC 179, SOC 181, SOC 182/URST 182, SOC 184
      (2) **Social Psychology:** SOC 173, SOC 174, SOC 175, SOC 177 E-Z, SOC 178, SOC 186E, SOC 186F, SOC 186G
      (3) **Social Inequality:** SOC 128, SOC 129, SOC 130, SOC 131 E-Z, SOC 132, SOC 133, SOC 135, SOC 161, SOC 162, SOC 163, SOC 164, SOC 165
      (4) **Criminology and Deviance:** SOC 134, SOC 144, SOC 145, SOC 147, SOC 149, SOC 159, SOC 180
      (5) **Family and Gender:** SOC 140, SOC 141, SOC 142, SOC 146, SOC 155 E-Z
   c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

Sociology/Administrative Studies Major

The major requirements for the B.A. and B.S. degree in Sociology/Administrative Studies are as follows:

For the Bachelor of Arts

Sociology Department requirements (14 courses [at least 56 units])

Students will not be admitted into the major until lower-division requirements are satisfied. All courses in the major must be taken for a letter grade.

1. **Lower-division requirements (5 courses [at least 20 units])**
   a) SOC 001 or SOC 001H with a grade of "C-" or better
   b) SOC 003, SOC 004, SOC 005 with a grade of "C-" or better in each
   c) One additional lower-division Sociology courses with a grade of "C-" or better
2. **Upper-division requirements (9 courses [at least 36 units])**
   a) SOC 168 or SOC 169
   b) A minimum of one course each selected from four of the following five areas of emphasis:

(1) **Social Institutions, Organizations and Change:** SOC 112, SOC 121, SOC 122, SOC 123, SOC 125, SOC 126, SOC 137, SOC 139/MCS 139, SOC 143/URST 143, SOC 150, SOC 151, SOC 156, SOC 160, SOC 176/BUS 176, SOC 179, SOC 181, SOC 182/URST 182, SOC 184

(2) **Social Psychology:** SOC 173, SOC 174, SOC 175, SOC 177 E-Z, SOC 178, SOC 186E, SOC 186F, SOC 186G

(3) **Social Inequality:** SOC 128, SOC 129, SOC 130, SOC 131 E-Z, SOC 132, SOC 133, SOC 135, SOC 161, SOC 162, SOC 163, SOC 164, SOC 165

(4) **Criminology and Deviance:** SOC 134, SOC 144, SOC 145, SOC 147, SOC 149, SOC 159, SOC 180

(5) **Family and Gender:** SOC 140, SOC 141, SOC 142, SOC 146, SOC 155 E-Z

c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

Administrative Studies requirements (37 units)

. **Lower-division courses (17 units)**

a) BUS 010, BUS 020

b) STAT 008 or equivalent (may be used to satisfy breadth requirements)

c) CS 008 (may be used to satisfy breadth requirements)

2. **Upper-division requirements (20 units)**

a) Two courses (8 units) from the list below:

(1) ECON 102 or ECON 103 or ECON 104A or ECON130 or ECON 162/BUS 162

(2) PSYC 140 or PSYC 142

(3) SOC 150 or SOC 151

(4) POSC 181 or POSC 182E or POSC 182G or POSC 183 or POSC 186

(5) ANTH 127 or ANTH 127S or ANTH 131

These two courses must be outside the discipline of Sociology and cannot be courses included as part of the three-course Business Administration track or their cross-listed equivalents.

b) A three-course track (12 units) in Business Administration courses from one of the following:

(1) **Organizations (General):** BUS 100W, BUS 107, BUS 158/ANTH 105, BUS 176/SOC 176, SOC 150, SOC 151

(2) **Human Resources Management/Labor Relations:** BUS 100W, BUS 107, BUS 121, BUS 144, BUS 145, BUS 153/ECON 153, BUS 155, BUS 156, BUS 157, PSYC 142

(3) **Business and Society:** BUS 100W, BUS 102, BUS 107, PHIL 116, POSC 182E or POSC 182G, POSC 186

(4) **Marketing:** BUS 103, and two from BUS 111, BUS 112, BUS 113, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119, BUS 124, BUS 126, BUS 151, BUS 152, BUS 159, BUS 164, BUS 182

(5) **Managerial Accounting/Taxation:** BUS 108, and two from BUS 166, BUS 168A, BUS 168B

(6) **Financial Accounting:** BUS 108, BUS 165A, BUS 165B, BUS 165C, BUS 167

(7) **Finance:** BUS 106/ECON 134 and two from BUS 131, BUS 132, BUS 134, BUS 135, BUS 136, BUS 137, BUS 138, BUS 139 BUS 140E, BUS 141, BUS 147

(8) **Management Information Systems:** BUS 101, BUS 110, BUS 125, BUS 128, BUS 171, BUS 172, BUS 173, BUS 174, BUS 175, BUS 179

(9) **Production Management:** BUS 104/STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

Note: In filling the dual requirements of the selected major, students may not count more than two courses toward both parts of their total requirements (Sociology requirements and Administrative Studies requirements).

For the Bachelor of Science

Sociology Department requirements (16 courses [at least 64 units])

Students will not be admitted into the major until lower-division requirements are satisfied. All courses in the major must be taken for a letter grade.

1. **Lower-division requirements (5 courses [at least 20 units])**

a) SOC 001 or SOC 001H with a grade of "C-" or better

b) SOC 003, SOC 004, SOC 005 with a grade of "C-" or better in each

c) One additional lower-division Sociology courses with a grade of "C-" or better

2. **Upper-division requirements (11 courses [at least 44 units])**

a) SOC 110, SOC 168, SOC 169

b) A minimum of one course each selected from four of the following five areas of emphasis:

(1) **Social Institutions, Organizations and Change:** SOC 112, SOC 121, SOC 122, SOC 123, SOC 125, SOC 126, SOC 137, SOC 139/MCS 139 SOC 143/URST 143, SOC 150, SOC 151, SOC 156, SOC 160, SOC 176/BUS 176, SOC 179, SOC 181, SOC 182/URST 182, SOC 184

(2) **Social Psychology:** SOC 173, SOC 174, SOC 175, SOC 177 E-Z, SOC 178, SOC 186E, SOC 186F, SOC 186G

(3) **Social Inequality:** SOC 128, SOC 129, SOC 130, SOC 131 E-Z, SOC 132, SOC 133, SOC 135, SOC 161, SOC 162, SOC 163, SOC 164, SOC 165

(4) **Criminology and Deviance:** SOC 134, SOC 144, SOC 145, SOC 147, SOC 149, SOC 159, SOC 180

(5) **Family and Gender:** SOC 140, SOC 141, SOC 142, SOC 146, SOC 155 E-Z

c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

Administrative Studies requirements (37 units)

1. **Lower-division courses (17 units)**

a) BUS 010, BUS 020

b) STAT 008 or equivalent (may be used to satisfy breadth requirements)

c) CS 008 (may be used to satisfy breadth requirements)

2. **Upper-division requirements (20 units)**

a) Two courses (8 units) from the list below:

(1) ECON 102 or ECON 103 or ECON 104A or ECON130 or ECON 162/BUS 162

(2) PSYC 140 or PSYC 142

(3) SOC 150 or SOC 151

(4) POSC 181 or POSC 182E or POSC 182G or POSC 183 or POSC 186

(5) ANTH 127 or ANTH 127S or ANTH 131

These two courses must be outside the discipline of Sociology and cannot be courses included as part of the three- course Business Administration track or their cross-listed equivalents.

b) A three-course track (12 units) in Business Administration courses from one of the following:

(1) **Organizations (General):** BUS 100W, BUS 107, BUS 158/ANTH 105, BUS 176/SOC 176, SOC 150, SOC 151

(2) **Human Resources Management/Labor Relations:** BUS 100W, BUS 107, BUS 121, BUS 144, BUS 145, BUS 153/ECON 153, BUS 155, BUS 156, BUS 157, PSYC 142

(3) **Business and Society:** BUS 100W, BUS 102, BUS 107, PHIL 116, POSC182, POSC 186

(4) **Marketing:** BUS 103, and two from BUS 111, BUS 112, BUS 113, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119, BUS 124, BUS 126, BUS 151, BUS 152, BUS 159, BUS 164, BUS 182

(5) **Managerial Accounting/Taxation:** BUS 108, and two from BUS 166, BUS 168A, BUS 168B

(6) **Financial Accounting:** BUS 108, BUS 165A, BUS 165B, BUS 165C, BUS 167

(7) **Finance:** BUS 106/ECON 134 and two from BUS 131, BUS 132, BUS 134, BUS 135, BUS 136, BUS 137, BUS 138, BUS 139 BUS 140E, BUS 141, BUS 147

(8) **Management Information Systems:** BUS 101, BUS 110, BUS 125, BUS 128, BUS 171, BUS 172, BUS 173, BUS 174, BUS 175, BUS 179

(9) **Production Management:** BUS 104/STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

Note: In filling the dual requirements of the selected major, students may not count more than two courses toward both parts of their total requirements (Sociology requirements and Administrative Studies requirements).

Sociology/Law and Society Major

The major requirements for the B.A. and B.S.

degrees in Sociology/Law and Society are as follows:

For the Bachelor of Arts

Sociology Department requirements (14 courses [at least 56 units])

The Law and Society major is open to undergraduate students with junior standing who have completed LWSO 100 with a grade of "C" or higher. Students will not be admitted into the major until lower-division SOC requirements are satisfied. All courses in the major must be taken for a letter grade.

1. **Lower-division requirements (5 courses [at least 20 units])**
   a) SOC 001 or SOC 001H with a grade of "C-" or better
   b) SOC 003, SOC 004, SOC 005 with a grade of "C-" or better in each
   c) One additional lower-division Sociology courses with a grade of "C-" or better
2. **Upper-division requirements (9 courses [at least 36 units])**
   a) SOC 168 or SOC 169
   b) A minimum of one course each selected from four of the following five areas of emphasis:
      (1) **Social Institutions, Organizations and Change:** SOC 112, SOC 121, SOC 122, SOC 123, SOC 125, SOC 137, SOC 143/URST 143, SOC 150, SOC 151, SOC 156 SOC 160, SOC 176/BUS 176, SOC 179, SOC 181, SOC 182/URST 182, SOC 184
      (2) **Social Psychology:** SOC 173, SOC 174, SOC 175, SOC 177 E-Z, SOC 178, SOC 186E, SOC 186F, SOC 186G
      (3) **Social Inequality:** SOC 128, SOC 129, SOC 130, SOC 131 E-Z, SOC 132, SOC 133, SOC 135, SOC 161, SOC 162, SOC 163, SOC 164, SOC 165
      (4) **Criminology and Deviance:** SOC 134, SOC 144, SOC 145, SOC 147, SOC 149, SOC 159, SOC 180
      (5) **Family and Gender:** SOC 140, SOC 141, SOC 142, SOC 146, SOC 155 E-Z
   c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

Law and Society requirements (36 units)

a) PHIL 007 or PHIL 007H
b) LWSO 100 (with a grade of "C" or better)
c) One course chosen from POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159.
e) Two courses chosen from HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180.
f) LWSO 193, Senior Seminar

Note: For sections d) and e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (Sociology requirements and Law and Society requirements).

For the Bachelor of Science

Sociology Department requirements (16 courses [at least 64 units])

The Law and Society major is open to undergraduate students with junior standing who have completed LWSO 100 with a grade of "C" or higher. Students will not be admitted into the major until lower-division SOC requirements are satisfied. All courses in the major must be taken for a letter grade.

1. **Lower-division requirements (5 courses [at least 20 units])**
   a) SOC 001 or SOC 001H with a grade of "C-" or better
   b) SOC 003, SOC 004, SOC 005 with a grade of "C-" or better in each
   c) One additional lower-division Sociology courses with a grade of "C-" or better
2. **Upper-division requirements (11 courses [at least 44 units])**
   a) SOC 110, SOC 168, SOC 169
   b) A minimum of one course each selected from four of the following five areas of emphasis:
      (1) **Social Institutions, Organizations and Change:** SOC 112, SOC 121, SOC 122, SOC 123, SOC 125, SOC 126, SOC 137, SOC 139/MCS 139, SOC 143/URST 143, SOC 150, SOC 151, SOC 156, SOC 160, SOC 176/BUS 176, SOC 179, SOC 182/URST 182, SOC 181, SOC 184
      (2) **Social Psychology:** SOC 173, SOC 174, SOC 175, SOC 177 E-Z, SOC 178, SOC 186E, SOC 186F, SOC 186G
      (3) **Social Inequality:** SOC 128, SOC 129, SOC 130, SOC 131 E-Z, SOC 132, SOC 133, SOC 135, SOC 161, SOC 162, SOC 163, SOC 164, SOC 165
      (4) **Criminology and Deviance:** SOC 134, SOC 144, SOC 145, SOC 147, SOC 149, SOC 159, SOC 180
      (5) **Family and Gender:** SOC 140, SOC 141, SOC 142, SOC 146, SOC 155 E-Z
   c) An additional four elective courses (at least 16 units) in Sociology (No more than 5 units from any combination of SOC 190, SOC 197, SOC 198-I.)

Law and Society requirements (36 units)

a) PHIL 007 or PHIL 007H
b) LWSO 100 (with a grade of "C" or better)
c) One course chosen from POSC 114, PSYC 012, SOC 004 (or equivalent course in research methods)
d) Three courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159.
e) Two courses chosen from HISA 120A, HISA 120B, HISE 123, LWSO 175 (E-Z), PHIL 164, POSC 111, POSC 166, POSC 168, POSC 186, SOC 147, SOC 149, SOC 180.
f) LWSO 193, Senior Seminar

Note: For sections d) and e) combined, not more than two courses may be taken from the same department. In filling the dual requirements of the major, students may not count more than two courses toward both parts of their total requirements (Sociology requirements and Law and Society requirements).

Minor

The requirements for the minor in Sociology are as follows:

1. **SOC 001, SOC 004, SOC 005**
2. **Sixteen (16) upper-division units from**
   a) SOC 168 or SOC 169
   b) Any three additional upper-division courses in Sociology with no more than 4 units in any combination of SOC 190, SOC 197, SOC 198-I

There can be no substitution for the courses listed without prior departmental approval.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Sociology Undergraduate Honors Program

Students who meet the departmental requirements for academic excellence are invited at the end of their junior year to participate in the Sociology Undergraduate Honors Program during their senior year. The students enroll in SOC 195 to work on an honors thesis under the supervision of a faculty member, for a total of 12 units distributed over three quarters. Students in the program also participate in SOC 199H, a year-long seminar led by the chair of Undergraduate Affairs Committee, for which they receive a total of 3 additional units of credit.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Graduate Program

The Department of Sociology offers the M.A. and Ph.D. degrees in Sociology. The graduate program in Sociology is designed to prepare students for research and teaching careers in the discipline of sociology. The graduate program is designed as a full-time course of study for students seeking the Ph.D. degree. The M.A. degree in Sociology is awarded as part of a student's required progress toward admittance into the Ph.D. program in Sociology. The Department of Sociology does

not award an M.A. degree to a student who already received an M.A. degree in Sociology from another institution.

Doctoral Degree

Admission

Admission into the graduate program is based on the following criteria:

1. Prior academic performance, especially in undergraduate or graduate Sociology classes
2. Letters of reference from persons familiar with an applicant's potential for achieving academic excellence
3. The extent to which an applicant's areas of expressed interest coincide with teaching and research emphases in the department
4. A writing sample: a professional or term paper
5. Record of overcoming adversity and contributions to diversity
6. Motivation to study, passion for, commitment to, and creativity in sociology

In general, students are admitted for the fall quarter of each academic year. Applicants to the graduate program for mid-year admissions are not recommended because the sequence of core courses is designed to begin with the fall quarter. The deadline for an application for admission for the fall quarter is December 5, also the deadline for various university fellowship programs. A detailed statement of degree requirements and procedures for the graduate degree is available at **https://sociology.ucr.edu/prospective-grad-student-info/** General university requirements of the Graduate Division are at **graduate.ucr.edu** and in the Graduate Studies section of this catalog.

The graduate program is designed to allow students to proceed through three distinct stages in their pursuit of the Ph.D. degree: the basic core program, the period of specialization, and writing the dissertation.

Basic Core Program

All students must complete the basic core program, regardless of whether they hold a baccalaureate or master's degree at the time of admission. A student is expected to complete the basic core program in not less than three and not more than six academic quarters. The chair of the graduate affairs committee advises students about the core program.

Course Requirements for the Core Program

1. In the core program, the minimum requirement is 44 units of academic work with no grade less than a "B". Work in the basic core courses must be distributed as follows:
   a) **Core sequence in theory:** SOC 202A, SOC 202B
   b) **Core course in research design:** SOC 200
   c) **Core sequence in qualitative methodology:** SOC 204A, SOC 204B
   d) **Core sequence in statistics:** SOC 203A, SOC 203B
   e) **Proseminar in Sociology:** SOC 232
   f) **Research colloquium:** SOC 293 (required in the first year)
   g) **Thesis writing:** SOC 250
   h) **A minimum of one course from each of two specialization areas** (excluding all courses in a-g above, as well as SOC 205, SOC 206, SOC 208, SOC 258, SOC 290, SOC 291, SOC 297, SOC 293, SOC 299, SOC 301 and SOC 401).

Format for Defenses and Oral Exam

As explained below, the department requires an MA thesis defense, an oral exam, and a dissertation defense. The department will allow any of the following formats for the defenses and exam: in person, hybrid, and remote. The student's committee chair will decide the format, taking into consideration the preferences of the student and committee members. In the case of hybrid exams, 1) anyone (student or committee member) can be in person and anyone can be online; and 2) the student, if participating in person, may participate without anyone else present in person.

M.A. Thesis and Oral Examination

Each student must complete a thesis for completion of the master's degree. This paper reflects the student's areas of theoretical and substantive interest since entrance into the program, and it is written in a form, content, and style appropriate for publication. A three-person faculty committee oversees the evaluation of the paper and the oral defense of the thesis. See **Format for Defenses and Oral Exam** section above for details on the format for the defense. The thesis must be completed and presented to the full department by the end of the student's sixth quarter of enrollment. If a student does not possess a Sociology MA from another institution and wishes to apply for the MA degree at UCR, the thesis must be submitted electronically to the Graduate Division, following the formatting guidelines provided on the Graduate Division web page. The normative time to an MA degree is 2 years.

On the basis of a favorable recommendation from the three-person faculty committee, the faculty votes to recommend the awarding of the M.A. degree in Sociology. If the M.A. is awarded or if the student already has an M.A. in Sociology, the faculty then votes on whether the student should continue in the Ph.D. program. If a student is allowed to continue in the Ph.D. program, the faculty then votes on whether to accept the two areas of specialization in which the student requests to be examined.

Professional Development Training

Each student must complete the following professional training courses: Soc 232 and Soc 293. Normally Soc 232 (Proseminar in Sociology) is completed in the fall of the first year as part of the core program. Soc 293 (Research Topics in Sociology) is required in the first year. In addition, Sociology 301: Directed Studies in the Teaching of Sociology is required prior to or concurrent with the completion of teaching assistantships in the program.

Period of Specialization

After admission to two areas of specialization (see M.A. Thesis and Oral Examination, above), students must complete coursework and qualifying examinations in two (one primary and one secondary) areas of specialization. A student must complete specialization coursework with a grade of "B" or better in each course. Other graduate-level courses may be used to fulfill this requirement with Graduate Affairs Committee approval. The areas of specialization offered in the department, and course requirements in these areas, are as follows:

1. **Criminology and Sociolegal Studies**
   SOC 249. Two (if primary) or one (if secondary) of the following SOC courses: 264F, 268, 278, 279, 280E, 280F, 280G, 280I, 280J, 280K, 280M, 280S.
2. **Gender Studies**
   Two (if primary) or one (if secondary) of the following SOC courses: 240, 256, 262, 264E, 264F, 264G, 264M, 264P, 264T, 268, 285N.
3. **Medical Sociology**
   SOC 284 and SOC 283. If primary, one additional from the following SOC courses: 286, 287, 288.
4. **Organizations and Institutions**
   Either SOC 244 or SOC 245. Two (if primary) or one (if secondary) of the following SOC courses: 242M, 243R, 243S, 253, 255I, 255L, 255M, 255N, 255O, 257E, 257F, 257G, 257J, 258, 263, 271, 280J
5. **Political Economy and Global Social Change**
   SOC 281. Two (if primary) or one (if secondary) of the following SOC courses: 243J, 243K, 243S, 251, 252, 255M, 257E, 255N, 257J, 258, 261, 263, 264M, 264P, 264T, 265J, 271, and 282. 258 can be taken to fulfill the specialization requirement or the advanced methods requirement, but not both. SOC 259 and SOC 260 are two unit courses that can be combined to substitute for one of the four unit courses listed above.
6. **Race and Class Inequality**
   SOC 246. Two (if primary) or one (if secondary) of the following SOC courses: 265F, 265I, 265J, 265R, 266, 267, 268, 271, 282. ETST 221 and ETST 245 also satisfy this requirement when taught by Dr. Mirandé.
7. **Social Psychology**
   SOC 248. Two (if primary) or one (if secondary) of the following SOC courses: 285E, 285F, 285G, 285I, 285J, 285K, 285N, 285S.

A student's program must include at least one academic quarter of classroom teaching experience at the college level. In addition, students must take one course in any area of specialization and at least one course (or the equivalent, 4 units) of advanced methods from within the department (SOC 205, SOC 206, SOC 208, SOC 258) with a grade of "B" or better in each course. Students must also give one additional research presentation (to the presentation of the MA) as part of the department colloquium series at some point in Years 3 through degree completion. All required coursework must be completed by the end of year three (9th quarter).

Examination Sequence

1. Standing committees composed of faculty in each area administer the written qualifying examination in the student's

primary and secondary areas of specialization. A student must complete written examinations in each area of specialization before the end of the fourth year of graduate study. Note In lieu of an exam in a secondary specialization, a student may produce, during the student's residence in the program, a soloauthored paper that has been published or accepted for publication as a peer-reviewed article or book chapter that fits the secondary specialization, as determined by the chair of the secondary specialization committee. If the MA thesis for the program is ultimately published, this published piece cannot count as the published paper for the secondary specialization.

2. Upon completion of 1) the two written area examinations, 2) the selection of a dissertation committee approved by the graduate advisor, and
3. a dissertation proposal, the student must complete and pass an oral examination covering the areas of specialization and the dissertation proposal. The oral examination is conducted by a committee of at least five faculty members, including 1) at least one faculty member from each of the two specialization areas, 2) three members of the student's dissertation committee (who may also represent the areas of specialization), and 3) one "outside member" from another department representing the faculty as a whole. See **Format for Defenses and Oral Exam** section above for details on the format for the oral exam.

Students who pass the oral examination and all course requirements are advanced to candidacy for the Ph.D. degree.

Dissertation and Final Oral Examination
The dissertation is normally completed within one year after advancement to candidacy. After the dissertation is prepared according to the rules and format of the Graduate Division and signed and approved by a student's dissertation committee, an oral defense of the dissertation is held. See **Format for Defenses and Oral Exam** section above for details on the format for the defense. The defense may be waived in exceptional circumstances. The dissertation must be filed electronically with the Graduate Division.

Normative Time to Degree for the PhD is 6 years, inclusive.

Lower-Division Courses

SOC 001 Introduction to Sociology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Covers the basic concepts and theories relating to the study of humans as participants in group life, analysis of culture, social institutions, personality development, and processes of social interaction. Credit is only awarded for one of SOC 001 or SOC 001H.

SOC 001H Honors Introduction to Sociology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to SOC 001. An in-depth look at concepts and theories relating to the study of humans as participants in group life, analysis of culture, social institutions, personality development, and processes of social interaction. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of SOC 001 or SOC 001H.

SOC 002 (E-Z) Sociological Foundations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. Selected topics which promote critical thinking skills essential for success in upper-division sociology courses. For hours and prerequisites, see segment descriptions.

SOC 002G Introduction to Global Change and Inequality 4 Lecture, 3 hours; activity, 3 hours. Prerequisite(s): SOC 001 or SOC 001H; or consent of instructor. Introduces basic concepts and perspectives in the macro-comparative study of social change and inequality at the global level. Explores causes and consequences of globalization in the arenas of economy, polity, and culture. Emphasizes their impacts upon various forms of inequality worldwide. Credit is awarded for one of the following SOC 002G or SOC 002GS.

SOC 002GS Intro Global Chg & Inequality 5 Lecture, 3 hours; discussion, 1 hour; activity, 3 hours. Prerequisite(s): SOC 001 or SOC 001H; or consent of instructor. Introduces basic concepts and perspectives in the macro-comparative study of social change and inequality at the global level. Explores causes and consequences of globalization in the arenas of economy, polity, and culture. Emphasizes their impacts upon various forms of inequality worldwide. Credit is awarded for one of the following SOC 002GS or SOC 002G.

SOC 002I Inequality in American Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. Examines inequality in modern American society and how gender, race, ethnicity, and social class maintain inequality.

SOC 002J Juvenile Delinquency 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. Analyzes the nature of delinquency and juvenile justice in American society. Emphasizes divergent models for administering justice, including pre-court stages, intake procedures, custody treatment, detention and release, adjudication, disposition, and post-adjudicatory supervision (including institutionalization).

SOC 002M Introduction to Criminology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. Analyzes the nature and patterning of criminality focusing on theoretical and methodological issues encountered in research. Examines explanations and crime control policies regarding linkages among social conflicts and inequalities, criminal laws and enforcement practices, and social deviance.

SOC 002R Racial and Ethnic Issues in American Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. Introduces issues and topics associated with racial and ethnic populations in U.S. society. Focuses on social processes that stratify American society by ethnicity and race.

SOC 002S Social Problems 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. The application of major sociological theories, concepts, and perspectives to the study of social problems in contemporary society. Utilizes an analytical approach.

SOC 003 Theoretical Perspectives in Sociology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better. Introduces the basic concepts and theoretical approaches that sociologists use to understand the social world. Prepares for upper-division sociology courses by examining major issues in sociology through the lens of different theoretical perspectives.

SOC 004 Methods of Sociological Inquiry 5 Lecture, 3 hours; discussion, 1 hour; research, 3 hours. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better. Applies the fundamentals of science to social research. Investigates problems of research design, sampling, measurement of social phenomena, conduct of field studies, and interpretation of qualitative and quantitative social data.

SOC 005 Statistical Analysis 5 Lecture, 3 hours; discussion, 1 hour; research, 3 hours. Prerequisite(s): SOC 004 with a grade of C- or better; or consent of instructor. Covers logical and procedural aspects of the application of statistical methods for data reduction and hypothesis testing in sociology. Includes distributions, tabulations, central tendency, variability, independence, contrasts, correlation and regression, and nonparametrics.

SOC 010 The Sociological Imagination 4 Lecture, 3 hours; extra reading, 7 hours; written work, 2 hours. Prerequisite(s): none. Designed to fulfill the breadth requirement for non-sociology majors in the humanities, arts, and social sciences. Introduces the sociological imagination through films and popular readings. Teaches sociological concepts as a means to think analytically about the social world and its diverse populations.

SOC 020 American Society 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. Examines the culture and structure of American society. Topics include beliefs, key institutions, community patterns, and systems of inequality.

SOC 028 Introduction to the Sociology of Gender 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduces gender as a system of inequality that organizes social life and shapes the distribution of resources, power, and privilege in ways that benefit men over women, including the social construction of gender in everyday life and the gendering of organizations and institutions such as the workplace.

SOC 030 Identity and Society 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): none. Studies the nature of the self, one's identities, and their role in social behavior. Examines the processes of self-verification, self-esteem, self-efficacy, and authenticity using social psychological theories. Introduces research methods that allow the study of self and identity processes.

SOC 031 Couples and Families 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines the major trends in marriage, families, and intimate relationships. Focuses on how inequality and diversity affect loving and family relations. Discusses the dynamics of gender inequality among families and couples and how family life is shaped by race and ethnicity, social class, divorce, and sexuality.

SOC 035 Global Political Economy 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): SOC 005 with a grade of C- or better or ECON 101 with a grade of C- or better or PSYC 011 with a grade of C- or better or STAT 004 with a grade of C- or better or STAT 008 with a grade of C- or better; or consent of instructor. Examines economic and political outcomes and assumes these are mutually constitutive. Focuses on macro-level phenomena and takes the global political economy (as it varies structurally and historically) as its unit of analysis. Applies the scientific method and draws broadly from qualitative and quantitative approaches. Credit is awarded for one of the following SOC 035 or SOC 035S.

SOC 035S Global Political Economy 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): SOC 005 with a grade of C- or better or ECON 101 with a grade of C- or better or PSYC 011 with a grade of C- or better or STAT 004 with a grade of C- or better or STAT 008 with a grade of C- or better; or consent of instructor. Examines economic and political outcomes and assumes these are mutually constitutive. Focuses on macro-level phenomena and takes the global political economy (as it varies structurally and historically) as its unit of analysis. Applies the scientific method and draws broadly from qualitative and quantitative approaches. Credit is awarded for one of the following SOC 035S or SOC 035.

SOC 036 The Sociology of Music 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H; or consent of instructor. Explores the social and cultural foundations of music. Addresses the connections to broader sociological themes using music as the subject of analysis. Examines the sociology of music in the context of creation and production of music, content of music, and reception and uses of music.

Upper-Division Courses

SOC 110 Multivariate Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 005 with a grade of C- or better; or consent of instructor. Involves computer analysis of social and behavioral data using statistical inference, multiple-regression, simulation, and multivariate nonparametric techniques.

SOC 111 World Inequality 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Covers the inequalities that manifest between and within countries. Focuses on economic disparities along with inequalities relating to gender dynamics, political representation, and health outcomes. Also explores other dimensions including poverty and inter-generational mobility. Offers a comparative examination of major world regions.

SOC 112 Sociology of the Labor Movement 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Introduces sociological literature related to the labor movement. Provides a comparative and historical overview of research on unions, workers' centers, and other organizational forms and collective actions through which working-class people have sought to improve their working and living conditions. Credit is awarded for one of the following SOC 112 or SOC 112S.

SOC 112S Sociology of the Labor Movement 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 4 hours; research, 4 hours. Prerequisite(s): SOC 001 or SOC 001H. Introduces sociological literature related to the labor movement. Provides a comparative and historical overview of research on unions, workers' centers, and other organizational forms and collective actions through which working-class people have sought to improve their working and living conditions. Credit is awarded for one of the following SOC 112S or SOC 112.

SOC 120 Society and Mental Health 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Covers the social causes and patterns of mental health and disorder in the United States. Examines scientific research on the social determinants of mental health and disorder, inequalities of mental health, and access to mental health care and US mental health care policies.

SOC 121 Sociology of the 1960s 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. A sociological approach to the economic, political, and cultural events of the 1960s. Analyzes the impact of such phenomena as civil rights, popular culture, theology, and political participation. Discusses the present-day legacy including personal histories of former activists. Credit is awarded for only one of SOC 121 or SOC 121S.

SOC 121S Sociology of the 1960s 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 4 hours; research, 4 hours; term paper, 4 hours; written work, 4 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. Introduces sociological literature related to the labor movement. Provides a comparative and historical overview of research on unions, workers' centers, and other organizational forms and collective actions through which working-class people have sought to improve their working and living conditions. Credit is awarded for only one of SOC 121 or SOC 121S.

SOC 122 Social Change 5 Lecture, 3 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 003 with a grade of "C-" or better or consent of instructor. A study of patterns of social change, resistance to change, and change-producing processes and agencies.

SOC 124 Sports, Competition, and Society 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduction to the sociology of sports. Surveys competitive sports groups with respect to the functions they perform, the allocation of roles, the use of rewards and punishments, risks and harms that athletes face, and deviant behavior. Offers a historical overview and examines factors that produce elite performance.

SOC 127 Sociological Determinants of Health 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 5 hours; research, 3 hours. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better; or consent of instructor. Introduces the role that social factors play in shaping the occurrence and distribution of disease and death in populations with an emphasis on socioeconomic status, racism, social relationships and social stress. A particular emphasis is placed on sociological origins of health inequalities. Cross-listed with PBPL 127.

SOC 128 Chicano Sociology 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Analysis of the Mexican experience in U.S. society. Explores the history as a minority; mass immigration in the twentieth century; relationships with American institutions; present socioeconomic status; variations in social status from region to region; political emergence and variations in values; and social relations and integration with non-Mexicans. Cross-listed with ETST 128. Credit is awarded for one of the following SOC 128, ETST 128, ETST 128S, or SOC 128S.

SOC 128S Chicano Sociology 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 4 hours; individual study, 4 hours; written work, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of the Mexican experience in U.S. society. Explores the history as a minority; mass immigration in the twentieth century; relationships with American institutions; present socioeconomic status; variations in social status from region to region; political emergence and variations in values; and social relations and integration

with non-Mexicans. Cross-listed with ETST 128S. Credit is awarded for only one of ETST 128/SOC 128 or ETST 128S/SOC 128S.

SOC 129 Racism in Western Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 005 with a "C-" or better or consent of instructor. An analysis of the origins, character, maintenance, and consequences of racism in Western society focusing on the United States.

SOC 130 Race and Ethnic Relations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 005 with "C-" or better or consent of instructor. A study of underrepresented racial and ethnic groups. Involves a comparative analysis of the dynamics and consequences of discrimination of racial and ethnic groups in the United States.

SOC 131 (E-Z) Selected Ethnic Groups 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. In-depth studies of particular ethnic groups in the United States. Treats a specific ethnic group for an entire quarter E. Native Americans; F. Black Americans; J. White Ethnics.

SOC 133 Inequality and Social Class 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 005 with a "C-" or better or consent of instructor. Covers the analysis of theory and research concerning sources of inequality in the distribution of scarce rewards in societies. Addresses the influence of aspects of social class and processes involving the hierarchical allocation of social groups to positions.

SOC 134 Law, Race, Class, Gender, and Culture 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. An introduction to law, jurisprudence, and legal reasoning focusing on the roles that race, class, gender, culture, and language play in law and jurisprudence. Includes an overview of the development of modern American legal thought and various schools of jurisprudence such as legal realism. Discusses modern challenges to legal formalism by critical legal studies, critical race theory, and feminist jurisprudence. Analyzes the equal protection doctrine and recent legal attacks on affirmative action and immigrants.

SOC 135 Conflict 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Analysis of the sources of social conflict, especially class conflict. Studies social movements arising out of such conflicts, which attempt to bring about fundamental social change. Credit is awarded for only one of SOC 135 or SOC 135S.

SOC 135S Conflict 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 4 hours; research, 4 hours; term paper, 4 hours. Prerequisite(s): SOC 001 or SOC 001H. Analysis of the sources of social conflict, especially class conflict. Studies social movements arising out of such conflicts, which attempt to bring about fundamental social change. Credit is awarded for only one of SOC 135 or SOC 135S.

SOC 137 Population 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 005 with a "C-" or better or consent of instructor. Introduction to the study of human populations including theories, concepts, and measures. Explores the social causes and consequences of population trends. Emphasizes population problems including population growth, fertility, migration, and mortality.

SOC 139 Mass Media and Popular Culture 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 or SOC 001H. A comparative analysis of the television, radio, record, cinema, and journalism industries as social institutions and a discussion of contemporary developments in mass communications theory. A study of the relationship between the social processes of modern society and the content of popular culture. Cross-listed with MCS 139.

SOC 140 The Sociology of Women 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S or SOC 001 or SOC 001H. Analyzes the role women have played in society emphasizing modern American society. Considers some of the social determinants of women's positions and the efforts being made to bring about change. Cross-listed with GSST 143.

SOC 141 Men and Masculinity 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 005 with "C-" or better or consent of instructor. A comparative and historical exploration of the social and personal meanings of masculinity focusing on the American experience. Topics include socialization, sports and war, friendship, intimacy, sexuality, fathering, and work. Concentrates on the role of masculinity in systems of gender inequality.

SOC 142 Sociology of the Family 5 Lecture, 3 hours; discussion, 1 hour; field, 3 hours. Prerequisite(s): SOC 005 with a "C-" or better or consent of instructor. A comparative and historical treatment of the family. Explores major theoretical frameworks developed for conceptualizing the family as a social system within the context of the relation between social structure and family group processes.

SOC 143 Urban Sociology 5 Lecture, 3 hours; extra reading, 3 hours; field, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. A comparative examination of metropolitan and other urban communities, with emphasis on processes of urbanization. Cross-listed with URST 143.

SOC 144 Interpersonal Relationship Violence 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better; SOC 004 with a grade of C- or better; SOC 005 with a grade of C- or better; or consent of instructor. Addresses causes, identification, and prevention of and responses to interpersonal relationship violence, such as family violence and partner violence. Examines theories and research findings for practical field application. Promotes better understanding of this common social problem and prepares for careers involving contact with victims and/or perpetrators of relationship violence. Cross-listed with SEHE 168.

SOC 145 Law and Subordination 5 Lecture, 3 hours; field, 6 hours. Prerequisite(s): upper-division standing in Ethnic Studies or Sociology; ETST 128/SOC 128 or ETST 128S/SOC128. A comparative and historical analysis of subordinated communities and law emphasizing integrating theoretical understanding of racial, class, and gender subordination. Includes field experience working directly with groups that have traditionally lacked equal access to the legal and judicial system. Cross-listed with ETST 145.

SOC 146 Gender in Global Perspective 4 Lecture, 3 hours; extra reading, 3 hours; written work, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or SOC 028. Examines gender using global and comparative perspectives. Explores how gender is constructed in different societies. Proves the relationship between gender and globalization. Considers resistance to global processes that create and reinforce gender inequalities.

SOC 147 Corrections 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 005 with a "C-" or better or consent of instructor. Involves a review, analysis, and criticism of the major techniques of resocialization of adult and juvenile offenders. Surveys the history, application, and theory of probation, parole, incarceration, and delinquency prevention programs. Discusses the methods involved in evaluating the effectiveness of correctional programs. May provide opportunities for field work.

SOC 148 Special Topics Discussion in Sociology 2 Discussion, 2 hours; written work, 2 hours; extra reading, 2 hours. Prerequisite(s): upper-division standing in Sociology or consent of instructor. Examines selected topics in Sociology through readings, weekly papers, and active student participation in seminar discussions. Topics and content of the course varies and are announced as the course is offered. Course is repeatable as topics change for a maximum of 8 units.

SOC 149 Organized Crime 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 005 with "C-" or better or consent of instructor. A review of the operations, structures, history, and theories of syndicated crime in the United States. Emphasizes the implications of organized crime on the development of criminological theory, the operation of formal organizations, and American ethnic relations.

SOC 150 The Sociology of Economic Organizations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines how the scope and nature of formal and informal organizations are shaped by sociological processes external to them, such as the influence of governments, institutions, networks, and resources. Illustrates the processes with examples from contemporary United States and from other periods and cultures.

SOC 151 Formal Organizations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Examines the structures of formal organizations, the forces that shape them, and the impact they have on their participants, their environments, and one another. Surveys the major classical and contemporary theories of human behavior in organizations.

SOC 155 (E-Z) Topics in the Sociology of Gender 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H; SOC 028. Intensively studies selected topics in the sociology of gender. E. Feminist Movements In The United States; G. Queer Theory. Course is repeatable to a maximum of units.

SOC 159 Sociology of Law 5 Lecture, 3 hours; discussion, 1 hour; field, 3 hours. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better; SOC 004 with a grade of C- or better; restricted to major(s) Law & Society, Sociology, Sociology/Administrative Stds, Sociology/Law and Society. Introduction to social scientific perspectives and research on the nature, sources, dimensions, and impact of law.

SOC 160 Sociology of Education 5 Lecture, 3 hours; discussion, 1 hour; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative analysis of educational institutions in complex societies and their relation to a society's political and economic structure. Examines the school as a societal subsystem consisting of teacher, student, and administrator roles with its own evolving subculture.

SOC 161 Immigration and Society 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Analyzes the origins of immigration and its nature, patterns, and trends in the twentieth century in Western societies, with special emphasis on the United States. Topics include theories of immigration, causes of immigration, sources of immigrants, immigration laws, reactions to immigrants, and the effects of immigration on the host society.

SOC 162 Linguistic Diversity in the United States 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Examines the linguistic diversity that has characterized the socio-historical development of United States society.

SOC 163 Social Forces and the Educational Condition of Chicanas/Os 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Examines the social forces that have shaped the Chicanas'/os' educational condition and evaluates models in the sociology of education that explain their educational situation.

SOC 164 Racial and Ethnic Diversity Issues in Higher Education 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): SOC 001 or SOC 001H; SOC 160 or SOC 163. Explores the issue of diversity in higher education. Focuses on racial and ethnic minority students and faculty.

SOC 165 Sociolinguistics and the Chicana/O Community 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H. Examines the regional and social variation in language use within the Chicana/o community. Focuses on the maintenance of Spanish language use, private versus public domains of language use, the need for bilingual social services, language as a human right versus language as a constitutional right, and the political economy context of language. Also addresses general sociolinguistic theory and methodology.

SOC 167 Medical Sociology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduces key concepts and theories in medical sociology and their application to a variety of health issues. Exemplar topics include social construction of health and illness, medicalization, stigma and labeling, patient-provider interaction, sociology of medical professionals, social determinants of health, and political economy of health. Cross-listed with PBPL 167.

SOC 168 Development of Sociological Theory 5 Lecture, 3 hours; discussion, 1 hour; written work, 3 hours. Prerequisite(s): SOC 003 with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Covers the emergence of sociology as a systematic discipline. Provides a critical analysis of sociological theory from the nineteenth and early and mid Twentieth Centuries.

SOC 169 Modern Sociological Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 003 with a grade of C- or better. An analysis and critical evaluation of sociological theory from 1920 to the present. Explores the growth of current sociological theories and recent trends in conceptual formulations.

SOC 173 Social Psychology: Sociological Orientation 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): SOC 003 and SOC 005 with grades of "C-" or better or consent of instructor. A study of the sociological contributions to theory and research in social psychology. Focuses on the relationship between culture and group life to human behavior and personality.

SOC 174 Socialization and Personality 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 003 and SOC 005 with grades of "C-" or better or consent of instructor. Analyzes socialization from various theoretical perspectives with emphasis on the impact of patterns of child rearing on personality development. Provides a historical and cross-cultural treatment focusing on the relation among family structure, social structure, and socialization processes.

SOC 175 Social Roles and Interaction 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better; SOC 004 with a grade of C- or better, SOC 005 with a grade of C- or better. Covers the nature of face-to-face contact between persons in everyday life. Examines the relationship among the social self, social roles, and communication in the day-to-day activities of people in informal groups, closed establishments, and public contacts.

SOC 176 The Sociology of Work in Organizations 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. Emphasizes the roles of individuals in organizations. Topics include the effects of jobs on workers, long-term trends in the nature of work, and differences in work among major segments of the labor force. Cross-listed with BUS 176.

SOC 177 (E-Z) Topics in Social Psychology: Sociological Orientation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 or SOC 001H; SOC 030. Intensively studies selected topics in social psychology, such as the individual and social change, attribution theory, experimentation in social psychology, exchange and consistency theories in social psychology, and applied social psychology. E. Social Psychology Of Gender; G. Theories Of Interpersonal Behavior.

SOC 178 Sociology of Emotions 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better; SOC 004 with a grade of C- or better; SOC 005 with a grade of C- or better; SOC 173 or SOC 174 or SOC 175. Surveys theory and research on emotions. Focuses on sociological and social psychological theories. Also covers evolutionary, biological, and cognitive theories. Studies a range of emotions such as shame and embarrassment; guilt, empathy, and sympathy; jealousy and envy; and anger.

SOC 179 Social Movements and Collective Action 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better; SOC 004 with a grade of C- or better; SOC 005 with a grade of C- or better; SOC 168 or SOC 169. Examines the emergence and outcomes of collective action and social movements. Considers the conditions under which social movements develop and why they succeed or fail. Utilizes sociological theories to understand collective action and social movements. Includes analysis of the U.S. civil rights movement, feminist movement, and LGBIT movement.

SOC 180 Deviance and Control 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better; SOC 004 with a grade of C- or better; SOC 005 with a grade of C- or better; or consent of instructor. Introduction to sociological analysis of deviance as defined by informal and formal processes of social control in varying cultural, legal, and political contexts.

SOC 181 World-Systems and Globalization 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 005 with a grade of C- or better, SOC 001 with a grade of C- or better or ECON 101 with a grade of C- or better or PSYC 011 with a grade of C- or better or STAT 004 with a grade of C- or better or STAT 008 with a grade of C- or better; or consent of instructor. Provides systematic comparisons of societies and world-systems emphasizing changes in the logic of social development. Credit is awarded for one of the following SOC 181 or SOC 181S.

SOC 181S World -Systems and Globalization 5 Lecture, 3 hours; discussion, 1 hour; research, 3 hours. Prerequisite(s): SOC 001 with a grade of C- or better, SOC 005 with a grade of C- or better or ECON 101 with a grade of C- or better or PSYC 011 with a grade of C- or better or STAT 004 with a grade of C- or better or STAT 008 with a grade of C- or better; or consent of instructor. Systematic comparisons of societies and world-systems with emphasis on changes in the logic of social development. Credit is awarded for one of the following SOC 181S or SOC 181.

SOC 182 Urban Problems 4 Lecture, 3 hours; discussion, 1 hour; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. An interdisciplinary examination of selected urban problems such as civil disorders, transportation, housing, welfare, and planning. Cross-listed with PBPL 182, and URST 182. Credit is awarded for one of the following PBPL 182, SOC 182, URST 182, or PBPL 178.

SOC 183 (E-Z) Special Topics in Sociology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores special topics in sociology. Segment H may be offered online or in-person. H. Aging In America; M. Geographic Inform Sysms & Mapping In Soc & Other Social Sciences:principles, Techniques, & Research; P. Poverty And Welfare; W. Social Mobility. Cross-listed with SEHE 170 (E-Z).

SOC 184 Environmental Sociology 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better, SOC 004 with a grade of C- or better, SOC 005 with a grade of C- or better. A sociological approach to the study of mainstream environmentalism. Addresses societal implications of environmental reform; the nature of distributive impacts (costs and benefits); environmental conflict resolution; land-use decision making; and the placement of noxious facilities in minority, working class, and poor communities.

SOC 187 Capstone Seminar in Sociology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): SOC 003 and SOC 004 with grades of "C-" or better; upper-division standing; a major in sociology. Examines selected topics in Sociology through readings, oral presentations, research and writing, and active student participation in seminar discussions. Course is repeatable as topics change to a maximum of 12 units.

SOC 189 Globalization and Development 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 001 with a grade of C- or better or SOC 001H with a grade of C- or better; SOC 004 with a grade of C- or better; restricted to class level standing of junior, or senior; or consent of instructor. Examines the trend, nature, and processes of multidimensional globalization. Explores broad implications of globalization in transforming the world in various aspects. Investigates development issues and how to build a better world.

SOC 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): upper-division standing; consent of instructor and Department Chair. Individual study, directed by a faculty member, to meet special curricular needs. Course is repeatable to a maximum of 15 units.

SOC 195 Senior Thesis 2 to 4 Total credit may not exceed 12 units. Required for all participants in the department's senior honors program, who must enroll for 4 units per quarter for a total of three quarters. Students wishing to undertake senior thesis projects outside the senior honors program, may enroll in SOC 195 for 2-4 units per quarter for one, two, or three quarters.

SOC 197 Research For Undergraduates 1 to 4 variable hours, Prerequisite(s): upper-division standing with consent of instructor. Directed original research. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SOC 198I Individual Internship in Sociology 1 to 12 Internship, 2 to 24 hours; written work, 1 to 12 hours. Prerequisite(s): SOC 004 with a grade of C- or better; restricted to class level standing of junior, or senior; and consent of instructor. Individual internship in community agencies to observe community processes. Course is repeatable to a maximum of 16 units.

SOC 199H Senior Honors Research 1 Research, 3 hours. Prerequisite(s): senior standing in Sociology. Required seminar for all participants in the department's senior honors program. Must be taken in conjunction with SOC 195, and for a total of three quarters. Course is repeatable.

Graduate Courses

SOC 200 Research Design 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides basic training in research design for sociologists. Begins with strategies for deriving theoretically informed empirical questions. Proceeds with discussion of how to collect and analyze date most appropriate to answer such questions. This course is required for both the M.A. and Ph.D. in Sociology. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 202A History of Sociological Theory 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the development of sociological theory from 1830 to 1930, stressing the major ideas, concepts, and principles developed by early social theorists.

SOC 202B Contemporary Sociological Theory 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 202A or consent of instructor. Examines sociological theory from 1930 to the present, stressing the major ideas, analyses, and principles developed by contemporary theorists.

SOC 203A Quantitative Methods 1 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing in Sociology or consent of instructor. Covers principles of partial and joint association, variance, and statistical estimation through the use of the general linear model for normal linear regression with continuous or categorical multiple independent variables. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 203B Quantitative Methods 2 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing in Sociology; SOC 203A or equivalent or consent of instructor. Covers generalizations of the general linear model to limited dependent variables. Also covers mixed models for data arising from nested, time-series, and pooled cross-sectional and time-series designs. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 204A Qualitative Methods 1 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. An overview of the uses of qualitative methods in sociology. Topics include epistemological questions, ethnography, interviewing, historical and comparative methods, and research ethics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 204B Qualitative Methods 2 4 Seminar, 3 hours; extra reading, 2 hours; research, 2 hours. Prerequisite(s): SOC 204A, graduate standing or consent of instructor. Designed to develop skills in conducting qualitative research. Emphasizes with the organization, interpretation/analysis, and presentation of textual data. Students who take this course to meet Sociology M.A./Ph.D. requirements

receive a letter grade; other students may be graded Satisfactory (S) or No Credit (NC) with consent of the instructor.

SOC 205 Categorical and Survival Data Analysis 4 Seminar, 3 hours; laboratory, 1 hour; extra reading, 2 hours., Prerequisite(s): SOC 203B, graduate standing; or consent of instructor. Introduces the analysis of limited dependent variables in social science and epidemiologic research. Covers in detail survival analysis including recent advances and emerging controversies. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 206 Advanced Methods in Quantitative Sociology 2 or 4 Seminar, 2 or 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Discusses sociological works in the quantitative tradition. Emphasizes developing and refining skills in quantitative methods. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content or topic changes to a maximum of 12 units.

SOC 208 Advanced Methods in Qualitative Sociology 2 or 4 Seminar, 2 or 4 hours. Prerequisite(s): graduate standing; or consent of instructor. Discusses sociological works in the qualitative tradition. Emphasizes developing and refining skills in qualitative methods. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content or topic changes to a maximum of 12 units.

SOC 210 Citizenship 4 Seminar, 3 hours; extra reading, 3,hours. Prerequisite(s): graduate standing or consent of instructor. Considers theories of citizenship. Focuses on the intersection of politics, economics, and culture, combining theoretical work and applied study. Designed for graduate students interested in social and political theory, cultural studies, and cultural policy studies. Sociology graduate students who are not advanced to candidacy for the Ph.D. receive a letter grade; other students receive a letter grade or petition for a Satisfactory (S) or No Credit (NC) grade.

SOC 222 Evolutionary Sociology 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing Reviews theory and research within sociology on evolutionary processes. Includes stage models of societal evolution, rise and demise of inter-societal or world systems, and biological bases for human behavior, interaction, and social organization.

SOC 232 Proseminar in Sociology 2 Lecture, 2 hours. Prerequisite(s): admission to the graduate program; graduate standing .An orientation to sociology as a scholarly discipline and empirical science. Includes an overview of ethical standards required of members of the American Sociological Association and training in seeking external fellowships and grants. Required of all first-year graduate students. Graded Satisfactory (S) or No Credit (NC).

SOC 240 Sociology of Gender 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Course will cover a broad variety of issues in the sociology of gender including socialization to gender roles, sexuality and sexual relations, housework, changing patterns of labor force participation, women in politics, and other germane issues. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOC 242 (E-Z) Sociological Theory 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): SOC 202A or SOC 202B; graduate standing. Advanced study in sociological theory: E. History Of Theory; F. Issues In Contemporary Theory; G. Issues In Theory Construction; M. Macrostructural Analysis.

SOC 243 (E-Z) Special Topics in Sociology 4 Lecture, 3 hours. Prerequisite(s): graduate standing. Critical analysis of current theory and research in special areas of sociology. Covers a single topic not contained in a regular course. Each topic is announced when the course is offered.

SOC 243E Evolutionary Sociology 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Examines new theoretical approaches that pursue evolutionary logic in sociology. Considers how these new theoretical insights and perspectives can be incorporated into traditional sociological models. Students who take the course to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

SOC 243F Sociology of Aging 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; consent of instructor. A comprehensive review of current theory and research in sociology of aging. Covers theories of adjustment to aging, demography and economics of retirement, family, friendship and community relations, minority aging and issues in social policy. Students who take the course to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

SOC 243G Geographic Information Systems and Mapping in Sociology and Other Social Sciences 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Introduces principles and techniques of geographic information systems and mapping in relation to sociology and other social science disciplines, such as political science, anthropology, history, and economics. Explores research applications in sociology and related disciplines. Students who take the course to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

SOC 243J Comparative and World Historical Sociology 4 Lecture, 4 hours. Prerequisite(s): graduate standing; consent of instructor. Topics include comparative national development, comparing world-systems, globalization, and social movements. Students who take the course to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

SOC 243K Social Change: Global Perspectives 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Analyzes the globalization of the world from the Paleolithic era to the present, emphasizing the modern period. Gives students a holistic understanding of social change by examining topics grouped under the rubric of globalization today. Students who take the course to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

SOC 243R Religion and Society 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Analysis of the relationship between society and religion. An examination of the social structures of selected Eastern and Western religions and the interplay of religion with other societal institutions from both a historical and comparative perspective. Students who take the course to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

SOC 243S Social Movements 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; consent of instructor. Provides an overview of the sociological literature on social movements. Reviews major theoretical debates about the rise, development, and impact of social movements as well as determinants of participation in social movements. Examines classic and contemporary case studies of various kinds of social movements. Students who take the course to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

SOC 244 Institutional Analysis 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The comparative and historical analysis of human social institutions, with emphasis on: (a) the emergence and development of the basic institutional systems of economy, polity, kinship, religion, law, and education; (b) the structure and process of these institutions in varying types of societies; (c) the interrelation of these institutions to each other and to other structuring processes. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOC 245 Large-Scale Organizations 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A review of the sociological literature on large-scale organizations. Provides an introduction to rational, political, ecological, economic, and institutional models of large-scale organizations. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOC 246 Race and Class Inequality 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to the various theories of racial and class inequality. Areas covered will include social scientific explanations for racial and ethnic inequality; ideological justifications for racial, ethnic, and class inequality; intersection of caste, class, and race in world inequality; and strategies to end inequality. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOC 248 Core Course On Social Psychology 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A review of the sociological literature on social psychology. Students who take the course to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

SOC 249 Contemporary Research and Theory in Criminology and Sociolegal Studies 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Review of basic issues and major contributions in studies of crime, deviance, and law. May be taken Satisfactory (S) or No Credit (NC) with permission of instructor and advisor.

SOC 250 Thesis Preparation 4 Seminar, 3 hours; Research, 3 hours. Prerequisite(s): SOC 200; graduate standing. Imparts the logic, process, and style of professional sociological research as students engage in supervised research integrating theory with data to satisfy the thesis requirements. Includes strategies to complete and communicate a thorough literature review, formulate theoretically driven empirical questions, report analytical results in a style consistent with professional standards. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 251 Current Research in Political Economy and Global Social Change 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Reviews current research in the field of political economy and global social change. Emphasizes new developments and promising new directions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable.

SOC 253 Current Research in Organizations and Institutions 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Reviews the latest research and theory on organizations and institutions, focusing on the relationship between organizations and institutions or between one institutional complex and the organizational systems within it. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 254 Current Research in Social Psychology 4 Seminar, 2 hours; research, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Reviews current theory and research and addresses future directions in social psychology. Graded Satisfactory (S) or No Credit (NC).

SOC 255 (E-Z) Topics in Large-Scale Organizations 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Advanced study of large-scale organizations: I. Organizational Theory; L. Methods Of Organizational Research; M. The Sociology Of Work; N. Economic Organization; O. Social Organization Of Sciences. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 256 Current Research in Feminist and Gender Sociology 4 Seminar, 2 hours; extra reading, 3 hours; written work, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Reviews current theory and research in feminist and gender sociology, with particular attention to new developments in the field. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 12 units.

SOC 257 (E-Z) Topics in Institutional Analysis 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Advanced seminars in institutional analysis: E. Economic Sociology; F. The Sociology Of Family And Kinship; G. The Sociology Of Education; J. Political Sociology. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 258 Quantitative Macro Comparative Methods 4 Seminar, 3 hours; research, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Imparts methodological skills necessary to advance quantitative-macro comparative social science. Begins with the logic and trans-methodological concerns of macro-comparative analysis. Quantitative methods covered include models for static time-series cross-section and panel data, dynamic panel data, nested data, structural equations, social networks, identification/causality and techniques for testing conditional hypotheses and visualization. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 259 Research Practicum On Transnational Social Movements 2 Lecture, 2 hours; discussion, 1 hour; extra reading, 1 hour; written work, 1 hour; research, 1 hour. Prerequisite(s): graduate standing in Sociology. Examines the history of and current developments in transnational social movements including inter-movement relations and North-South issues within movements, as well as the development of global civil society. Focuses on collaborative research projects, though may also include development of individual projects. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable for a maximum of 12 units.

SOC 260 Research Practicum On the Evolution of Settlements and Polities 2 Lecture, .5 hours; discussion, .5 hours; practicum, 1 hour; workshop, .5 hours; extra reading, 2.5 hours; individual study, 2.5 hours; research, 2.5 hours; written work, 2.5 hours. Prerequisite(s): graduate standing in Sociology. Focuses on ongoing collective research projects on the evolution of polities and settlements. Studies the growth and decline of human settlements and polities in world historical and evolutionary perspective including those in nomadic and small-scale sedentary societies, early cities and states, and the emergence of empires and contemporary world cities. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 12 units.

SOC 261 World-Systems Analysis 4 Seminar, 4 hours. Prerequisite(s): graduate standing or consent of instructor .Focuses on social evolution, world-systems analysis, and globalization. Students who take the course to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

SOC 262 Feminist Theory 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides an overview of recent debates about theory and method in gender studies. Explores relationships between feminist theory, feminist practice, and social science. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 263 Women and Work in World Historical Perspective 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the role of women as workers in a variety of societies. Considers the role of women in developments and the impact of development on women's economic roles. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 264 (E-Z) Topics in Gender Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Advanced study in the sociology of gender. E. Gender And Families; F. Domestic And Sexual Violence; G. The Sociology Of Men; M. Gender In Comparative Perspectives; P. Gender, Politics, And Public Policy; T. Transnational Sex, Romance, And Marriage. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 265 (E-Z) Topics in Race and Class Inequality 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Advanced study in race and class inequality. F. Black America; I. Chicano Sociology; J. World Inequality; R. Racial, Ethnic, And Immigrant Families. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 266 Race and Ethnic Relations 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A review of sociological literature on race and ethnic minorities, patterns of conflict and ethnic antagonism, and systems of dominance. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 268 Law, Race, Class, and Gender 4 Seminar, 3 hours, research, 3 hours, Prerequisite(s): graduate standing or consent of instructor. Presents an analysis of how issues of race, class, and gender shape legal thought and jurisprudence. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOC 271 Inequality and Stratification 4 Lecture, 3 hours; seminar, 1 hour; research, 2 hours; term paper, 1 hour; written work 1 hour; individual study, 4 hours. Prerequisite(s): graduate standing or consent of instructor. Survey's the broad sociological literature on inequality and stratification. Key foci include the principle causes of income and earnings inequality in the United States and internationally. After some attention to general theory, weekly topics include causes related to race, class, gender, organizations, structural and socioeconomic changes and institutions. May be taken Satisfactory (S) or No Credit (NC) by students advanced to candidacy for the Ph.D.

SOC 278 Punishment and Correction: Evaluating Theories and Policies 4 Seminar, 3 hours; research, 3 hours, Prerequisite(s): graduate standing or consent of instructor. Takes a critical and evaluative approach to the punishment and correctional systems, assessing what "works and doesn't work" in efforts to reduce crime and delinquency. Examines prisons, probation, and other crime control measures from a perspective emphasizing the need for systematic evaluation research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 280 (E-Z) Topics in Criminology and Sociolegal Studies 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing. Advanced seminars in criminology and sociolegal studies. E. Patterns Of Criminal And Deviant Behavior; F. Ecological Perspectives On Crime And Delinquency; G. Biological And Psychobiological Studies Of Crime And Delinquency; I. Conflict And Radical Approaches In Criminology And Sociolegal Studies; J. Sociological Theories Of Law; K. Law, Power, And Social Conflict; M. Political Criminality; S. Substance Use And Crime. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 281 Political Economy and Global Social Change 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on classical and contemporary political economy, social movements, and the historical development of social systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 282 International Migration 4 Seminar, 4 hours. Prerequisite(s): graduate standing; or consent of instructor. A research course in the concepts, theories, and techniques used in the analysis of international migration. Covers the nature and origins of patterns and trends in global migration from colonial times to the twenty-first century. Provides an overview of migration theories, migration policies, current research on immigration. Course is repeatable.

SOC 284 Medical Sociology Graduate Seminar 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Survey's key concepts and theories in medical sociology and their application to a variety of health issues. Exemplar topics include social construction of health and illness, medicalization, stigma and labeling, patient-provider interaction, sociology of medical professionals, and social determinants of health. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 285 (E-Z) Topics in Social Psychology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Advanced study in family and social psychology. E. Theory In Social Psychology; F. Neurosociology; G. The Interaction Process; I. Sociolinguistics; J. Social Psychology Of Emotions; K. Small Groups; N. Social Psychology Of Gender; S. Self And Identity. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 286 Life Course and Health 4 Seminar, 4 hours; term paper, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Covers sociological theories, interdisciplinary theories and methods for life course approaches to health. Discusses health outcome measurements, study design, and sources on bias. Includes historical influence, structural constraints, human agency, minority health and early origins of adult health and intergenerational influence. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 287 Migration and Health 4 Seminar, 3 hours; term paper, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Provides a comprehensive overview of the central theoretical debates and empirical work on migration and health. Topics include the theoretical and methodological challenges associated with studying migration and health; the long-term health effects of migration; and emerging areas in migration and health. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 288 Social Determinants of Health 4 Seminar, 4 hours; term paper, 5 hours. Prerequisite(s): recommended that students have basic qualitative and quantitative methods training; graduate standing; or consent of instructor. Focuses on how social factors shape patterns and experiences of health and illness for individuals and populations. Covers the impact on accessing medical care. Includes many other "mechanisms" or "pathways", social environments, personal beliefs, behaviors/lifestyles, stress, and access to resources, that may promote or harm health. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

SOC 290 Directed Studies 1 to 6 Scheduled research, 3-15 hours; consultation, 1 hour, Prerequisite(s): graduate standing and consent of instructor. This course is designed to provide students with reading and research work under the tutorial supervision of a faculty member in support of developing their knowledge of specialty areas and/or preparing original research work. With consent of the graduate advisor, this course may be taken for a letter grade to satisfy required seminars in the period of specialization if regular seminars are not available. Otherwise course will be graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SOC 291 Individual Study in Coordinated Areas 1 to 12 Individual Study, 3 to 36 hours. Prerequisite(s): graduate standing. A program of study designed to advise and assist candidates who are preparing for doctoral examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SOC 293 Research Topics in Sociology 2 Lecture, 2 hours. Prerequisite(s): graduate standing in Sociology. A series of lectures by guests, faculty, and advanced graduate students on research topics in sociology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SOC 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing. Individual research performed under the direction of a faculty advisor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SOC 299 Research For Thesis Or Dissertation 1 to 12 Prerequisite(s): graduate standing or consent of instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Course

SOC 301 Directed Studies in the Teaching of Sociology 2 Consultation, 1 hour; practicum, 3 hours. Prerequisite(s): consent of instructor; prior or concurrent enrollment in the Teaching Assistant Development Program offered by the Graduate Division. Discussion and evaluation of pedagogical techniques and materials used in the teaching of sociology at the college level. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Soil and Water Sciences

The program in Soil and Water Science is not currently accepting new students. We encourage you to visit the catalog section for Environmental Sciences to meet your graduate study needs.

If you have questions please call (800) 735-0717 or (951) 827-5621.

Southeast Asian Studies Minor

Subject abbreviation: SEAS
College of Humanities, Arts, and Social Sciences

seatrip.ucr.edu

The SEATRiP Program at the University of California, Riverside—Southeast Asia: Texts, Rituals, Performance—brings together scholars who share an ongoing interest in the arts and humanities and are actively engaged with the languages and expressive cultures of Southeast Asia.

The Southeast Asian Studies minor is an interdepartmental program centered on the study of the arts and cultures of Southeast Asia. The scholars associated with the Program address regionally-specific texts, rituals and performances. They seek to develop better understandings of the forms and practices through which ideas and ideologies are creatively expressed, shaped and communicated within and among different societies of Southeast Asia as week as the Southeast Asian diaspora.

1. **Lower-division requirements (8 units)**
   a) Four (4) units from lower lower-division lecture courses on Southeast Asian literature and culture:

   AST 049/HIST 046/SEAS 047, AST 062/CPLT 062, AST 063/CPLT 063, AST 064/MCS 049/VNM 064, AST 065

   b) Four (4) units chosen from above or from one of the Southeast Asian languages (Vietnamese/Indonesian/Tagalog).
2. **Upper-division requirements (16 units):**
   a) Sixteen (16) units in Southeast Asian literature and culture chosen from

   ANTH 126/AST 123/ DNCE 123/ MUS 123, ANTH 136, ANTH 140I, ANTH 176/AST 127/DNCE 127/ETST 172/MUS 127, AST 126/HIST 125/SEAS 185, AST 129/HIST 186/SEAS 186, AST 160/HIST 184/SEAS 184/VNM 184, AST 161, AST 162/HIST 167/SEAS 162/VNM 162, AST 163/CPLT 163, AST 164/VNM 164, AST 165 (E-Z)/VNM 165 (E- Z)/GSST 165(E-Z), AST 166/CPLT 166/VNM 166, AST 167/CPLT 167, AST 168/MUS 168, AST 170/MUS 170, AST 187/MCS 167, AST 189/HIST 189/SEAS 189/VNM 189, CPLT 142V/GSST 142V, CPLT 173V/MCS 173V, DNCE 180J, ENGL 144J/MCS 144J, ETST 133, ETST 137/SEAS 137, ETST 143A, ETST 143B, MCS 123/GSST 124, MCS 142/GSST 122, RLST 145/SEAS 145, RLST 149, RLST 150

   b) No more than Four (4) units may count from performance ensemble courses.

Southeast Asian Studies Graduate Program

Subject abbreviation: SEAS
College of Humanities, Arts, and Social Sciences

seatrip.ucr.edu

Committee in Charge

Weihsin Gui (English)
Muhamad Ali (Religious Studies)
David Biggs (History)
Charmaine Craig (Creative Writing)
Tamara Ho (Gender and Sexuality Studies)
Emily Hue (Ethnic Studies)
Mariam B. Lam (Comp Lit & Lang)
Sally A. Ness (Anthropology)
Victoria Reyes (Sociology)
Maria Sarita Echavez See (Media & Cultural Studies)
Christina Schwenkel, Chair (Anthropology)
Rican Vue, Ph.D. (Education)
Deborah A. Wong (Music)
Daryle Williams, Dean, *ex officio*

Graduate Program

The Master's Program in Southeast Asian Studies is an interdepartmental program centered on the study of the arts and cultures of Southeast Asia and its diasporas. To understand Southeast Asia as a region, students need to make sense of and engage with its diverse expressive forms of culture (including visual arts, literature, and performance) which are crucial in building and maintaining individual as well as group identity both within and across national or ethnic boundaries.

This program is designed for students with a strong interest in Southeast Asia, including those already admitted or enrolled in another graduate program. Students can be concurrently enrolled in both the Southeast Asian Studies M.A. program and another graduate degree program. Students may also apply concurrently for the Southeast Asian Studies M.A. - Ph.D. Track in Anthropology, Comparative Literature, Ethnic Studies, History or Music.

Admission

All applicants must fulfill the standard admission requirements as established by the Graduate Division. Additionally, applicants must submit a Statement of Purpose to indicate a serious interest in Southeast Asian Studies (or a specific country or area in this region) as well as a writing sample (such as a past term paper or course essay) to demonstrate basic skills of scholarship.

Foreign Language

Students must acquire (or increase) a distinct level of proficiency in at least one language relevant to Southeast Asian Studies prior to beginning research for the thesis and no later than the fifth quarter in the program. The required proficiency can be demonstrated by way of an exam, by completing one year of course work with a "B" or better, or by alternate certification, including completion of an approved intensive summer language program.

International students from Southeast Asia may use their native language to fulfill this requirement.

Course Work
All students are required to pass the Proseminar in Southeast Asian Studies (ANTH 202/CPLT 200/SEAS 200) with a "B" or better. Additionally, students must pass (with a "B" or better) a graduate level seminar in four of the following six areas (any 100-level course must be paired with SEAS 292):

1. **Southeast Asian performance**
   ANTH 126/AST 123/DNCE 123/MUS 123, ANTH 176/AST 127/DNCE 127/ETST 172/MUS 127, AST 119/MUS 119, AST 124/MUS 124
2. **Southeast Asian religions**
   ANTH 257/ RLST 253/ SEAS 202, RLST 111, RLST 150/SEAS 150, RLST 200B, RLST 252
3. **Southeast Asian cultures**
   SEAS 203/ANTH 203, ANTH 136/SEAS 136, ANTH 140I
4. **History of Southeast Asia**
   SEAS 204/HIST 242, AST 126/HIST 185/SEAS 185, AST 129/HIST 186/SEAS 186, AST 160/HIST 184/SEAS 184/VNM 184
5. **Literatures of Southeast Asia**
   SEAS 205/CPLT 205, AST 163/CPLT 163/SEAS 163, AST 167/CPLT 167/SEAS 167
6. **Media in Southeast Asia**
   SEAS 206, AST 187/MCS 167/SEAS 177, CPLT 173U/MCS 173U

In addition, students can select four other graduate seminars or approved upper division undergraduate courses in accordance with their main field of interest and after approval by the Graduate Advisor and the student's Thesis Committee. A total of 40 units of coursework, including thesis, are required for the degree in Southeast Asian Studies.

Students concurrently enrolled in another graduate program may, when appropriate, include units earned in that program toward the 40 units of the M.A. in Southeast Asian Studies. However, there must be at least 36 units uniquely applied to the Southeast Asian Studies degree.

Plan I (Thesis)
Students enrolled in the Southeast Asian Studies Graduate Program (for the terminal M.A.) who choose the thesis option must submit an essay (thesis) of 50-70 pages reflecting original research, written under the supervision of a member of the program who also functions as the chair of their Thesis Committee. At the beginning of the second year students should write a research proposal outlining their research project. Approximately ten pages in length this proposal should describe the aims of the research and provide a broader theoretical framework. After this is approved students begin to conduct individual research in the field or in the library. Students must enroll in a minimum of 4 units of Thesis Study (SEAS 299) or Directed Research (SEAS 297) under the supervision of a Southeast Asian Studies faculty. Before filing the thesis with the Graduate Division students must pass a formal oral examination or defense.

Plan II (Comprehensive Exam)

a) Students enrolled in the Southeast Asian Studies Graduate Program (for the terminal M.A.) who choose the comprehensive examination must submit a final project made up of two components: a) participation in community activism, volunteer work, or an internship; b) a written report of 25-30 pages. Students must enroll in a minimum of 4 units of Directed Research (SEAS297) under the supervision of a Southeast Asian Studies faculty who also functions as the chair of their Comprehensive Exam Committee. The student's coursework, activism or internship experiences, and written report will be the basis for a comprehensive oral exam. Students must submit the written report to their adviser and exam committee members before the exam. Students must pass the comprehensive exam in order to receive their M. A. degree.

b) Students concurrently enrolled in another degree program requiring an M.A. thesis may (with the approval of the Southeast Asian Studies faculty) be awarded the M.A. degree by passing a comprehensive oral examination on the basis of that thesis connected to Southeast Asia and its diasporas.

Concurrent Enrollment
Concurrent Enrollment students are enrolled in both the M.A SEAS program and a Ph.D. program in a cooperating department. These students must complete the following 40 units to earn the degree:

- 20 units of core courses, listed above, unique to SEAS program.
  - SEAS 200
  - 4 courses from the 6 above areas
- 16 elective units can be from the home Ph.D. program with the approval of SEAS faculty.

4 units in either SEAS 297 or 299 toward completing the comprehensive exam or thesis.

M.A. – Ph.D. Track
M.A. – Ph.D. Track students are in the M.A SEAS program and have been preliminarily accepted to a Ph.D. program in a cooperating department. These students must complete the following 40 units to earn the degree:

- 20 units of core courses, listed above, unique to SEAS program.
  - SEAS 200
  - 4 courses from the 6 above areas
- 16 elective units can be from the home Ph.D. program with the approval of SEAS faculty.
- 4 units in SEAS 299 toward completing the thesis.

Continuation in the Ph.D. program is not guaranteed, but subject to review by the cooperating department. After completion of the M.A. in Southeast Asian Studies, M.A. – Ph.D. track students will need to reapply through Graduate Admissions (fee waived) to the cooperating department for approval and official admission into the Ph.D. program.

University Requirements

All master's students must be enrolled for at least three quarters to fulfill the University residency requirement and must hold at least a 3.00 GPA in all upper division and graduate level course work related to the degree. A minimum of 40 units must be completed of which 36 must be graduate level (200 level) or approved upper division undergraduate (100 level) and apply only to the M.A. in Southeast Asian Studies.

Normative Time to Degree Two years

Lower-Division Courses

SEAS 062 Introduction to Southeast Asian Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introduction to modern and contemporary Southeast Asian literature and culture with a focus on individual national histories. Explores the relationship between aesthetics, politics, and academic scholarship. Readings are in translation; classes conducted in English. Cross-listed with CPLT 062, and AST 062.

SEAS 063 Reading Southeast Asian Stories 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. An introduction to the modern short story in Southeast Asia focusing on literariness and the act of reading. Readings are in translation; classes conducted in English. Course is repeatable as content or topic changes to a maximum of 8 units. Cross-listed with AST 063, and CPLT 063.

SEAS 064 Introduction to Vietnamese and Diasporic Film Culture 4 Lecture, 3 hours; screening, 3 hours. Prerequisite(s): none. Engages in critical viewing strategies and analytical visual critique. Explores the revival of film production in Vietnam following the Vietnam War, with a focus on the means of production, state control, and international distribution. Readings are in translation; classes conducted in English. Cross-listed with VNM 064, AST 064, and MCS 049.

Upper-Division Courses

SEAS 123 Southeast Asian Performance 4 Lecture, 3 hours; screening, 2 hours; extra reading, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduction to the roles and genres of expressive culture in Southeast Asia, including dance, music, theater, film, and digital culture. Performance is discussed as both a time-honored and a contemporary medium for cultural production, from the courts to everyday experience. Cross-listed with ANTH 126, AST 123, DNCE 123, and MUS 123.

SEAS 127 Music Cultures of Southeast Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in the Philippines, Indonesia, Malaysia, Thailand, Myanmar (Burma), Laos, Cambodia, and Vietnam. Designed for the student interested in the performing arts and cultures of mainland and insular Southeast Asia. No Western music background is required. Cross-listed with ANTH 176, AST 127, DNCE 127, ETST 172, and MUS 127.

SEAS 130 Filipino American Culture 4 Seminar, 3 hours; screening, 3 hours. Prerequisite(s): MCS 001. Explores the politics of a range of Filipino American expressive, performative, and creative forms (e.g., Pilipino Culture Night) video, art, fiction, theater, in tandem with the study of theoretical and socio-historical scholarship in the interdisciplinary field of Filipino American Studies. Cross-listed with MCS 130.

SEAS 136 Anthropological Perspectives On Gender in Southeast Asia 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s):ANTH 001 or ANTH 001H or ANTH 001W or equivalent. Examines the intersections of gender, power, and sexuality in post-colonial Southeast Asia. Revisits early ethnographic claims of gender equality. Addresses current anthropological literature on the effects of colonialism, capitalism, and globalization on gender roles and relations within national and transnational contexts. Cross-listed with ANTH 136. Credit is awarded for only one of ANTH 136/SEAS 136 or ANTH 136S/SEAS 136S.

SEAS 136S Anthropological Perspectives On Gender in Southeast Asia 5 Lecture, 3 hours; discussion, 1 hour; field, 1 hour; extra reading, 2 hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 001W or equivalent Examines the intersections of gender, power, and sexuality in post-colonial Southeast Asia. Revisits early ethnographic claims of gender equality. Addresses current anthropological literature on the effects of colonialism, capitalism, and globalization on gender roles and relations within national and transnational contexts. Cross-listed with ANTH 136S. Credit is awarded for only one of ANTH 136/SEAS 136 or ANTH 136S/SEAS 136S.

SEAS 137 The Vietnamese Americans: the Refugee and Immigrant Experience 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on the Vietnamese American experience in contemporary society. Emphasizes the relationship of Vietnamese Americans to the larger society and on intergenerational strains and conflicts. Topics include socioeconomic and educational problems, family, religion, and the relationship between Vietnamese Americans and other ethnic groups. Cross-listed with ETST 137.

SEAS 143 Critical Filipino(a) Studies: Histories and Legacies of United States Conquest, Colonialism,& Empire 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): ETST 001 or ETST 001H or ETST 002 or ETST 002H or ETST 003 or ETST 004 or HIST 004 or ETST 005 or ETST 005H or ETST 007 or ETST 007H or ETST 008 or ETST 012 or ETST 012H or RLST 012 or RLST 012H or ETST 014; or consent of instructor. Critically examines and theorizes the historical impact and legacies of U.S. conquest and colonialism in the Philippines. Analyzes the origins of Filipino American civic existence and its links to histories of U.S. racial formation, racialized industrialization, and racialized frontier warfare. Cross-listed with ETST 143.

SEAS 149 Southeast Asian Religions 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one Religious Studies course or upper-division standing or consent of instructor. Introduces aspects of religion in various Southeast Asian countries including Indonesia, Malaysia, Thailand, Cambodia, Vietnam, and the Philippines. Provides contextualized readings featuring historical, anthropological, literary, and other disciplinary perspectives. Cross-listed with RLST 149.

SEAS 150 Islam in Southeast Asia 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the religious, intellectual, and cultural history of Muslim Southeast Asia. Includes Indonesia, Malaysia, and Brunei, as well as minority communities in Singapore, Thailand, Cambodia, and the southern Philippines. Examines a series of contextualized readings in translated primary sources. Approaches texts from historical, anthropological, literary, and other disciplinary perspectives. Cross-listed with RLST 150.

SEAS 161 Translating Modern Southeast Asian Texts 4 Lecture, 3 hours; term paper, 1.5 hours; written work,1.5 hours. Prerequisite(s): upper-division standing; knowledge of one Southeast Asian language is recommended. An introduction to translating modern Southeast Asian texts into English. Presents translations of texts from Vietnam, Indonesia, and the Philippines in a context of theory. Materials are in English. Course is repeatable as content changes to a maximum of 8 units. Cross-listed with AST 161.

SEAS 162 Vietnamese Literary History 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing. A historical analysis of Vietnamese literature from its oral tradition to contemporary fiction. Follows the formation of the nation-state and the subsequent struggles with the Chinese, French, Japanese, and Americans. No knowledge of Vietnamese required. Readings are in translation or bilingual editions. Classes are conducted in English. Cross-listed with AST 162, VNM 162, and HIST 187.

SEAS 163 Nationalism and the Novel 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the novel and its role within nationalism as a representative summary or mirror of the nation. Cross-listed with CPLT 163, and AST 163.

SEAS 164 Vietnamese American Culture 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the pervasive aspects of Vietnamese American culture. Includes shared histories, acculturation patterns, class diversity, identity struggles, community-building literary and cultural production, youth issues, and cultural survival. Also introduces foundational literature, visual culture, and scholarship in the field. Cross-listed with VNM 164, and AST 164.

SEAS 165 (E-Z) Themes in Vietnamese Literature 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. An exploration of Vietnamese literature in translation as seen through the lens of a particular theme or issue. Focuses on the implications of gender and sexuality on nation formation. All materials are read or viewed in English. E. Women And War. Cross-listed with AST 165 (E-Z), GSST 165 (E-Z), and VNM 165 (E-Z).

SEAS 166 Vietnam and the Philippines 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the comparative national histories of Vietnam and the Philippines by way of great literary works in various genres including poetry, short fiction, and novels. All materials are read in English. Cross-listed with CPLT 166, AST 166, and VNM 166.

SEAS 167 Postcolonial Literature and Criticism in Southeast Asia and South Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores how the theoretical concepts of postcolonial criticism inform and challenge the literature of Southeast Asia and South Asia, as the literature itself pushes the limits of the criticism. Addresses themes of nation, identity, space, gender, home, diaspora, alterity, history, sexuality, transnationalism, neocolonialism, tourism, and education. Cross-listed with CPLT 167, and AST 167.

SEAS 168 Javanese Gamelan Ensemble: Beginning 2 Studio, 6 hours. Prerequisite(s): upper-division standing and consent of instructor. Study and performance of the Central Javanese gamelan, consisting mainly of gongs and gong-chime instruments. Readings and discussions focus on Javanese culture. Course is repeatable. Cross-listed with AST 168 and MUS 168.

SEAS 170 Rondalla Ensemble 1 to 2 Studio, 2 to 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Study and performance of the Filipino rondalla, an ensemble consisting of various sizes of lure-like and guitar-like instruments. Discussions focus on Filipino culture. Cross-listed with AST 170 and MUS 170. Course is repeatable.

SEAS 172 Gender in Southeast Asian Diasporic Literature and Film 5 Lecture, 3 hours; screening, 3; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on former Indochinese refugees who are producing literature and films in the United States and France. Examines how the perception of Indochina has been constructed, particularly how the region has been gendered female in the colonial imaginary. Explores the return of Southeast Asian immigrants to the Western gaze. Cross-listed with GSST 122, and MCS 142.

SEAS 175 Asian American Women: Writing the Self in Literature and Film 4 Lecture, 3 hours; screening, 1 hour; written work, 1 hour; extra reading, 1 hour. Prerequisite(s): MCS 010, upper-division standing, or consent of instructor. Analyzes Asian American autobiographies and films written and directed by women. Explores why the genre of autobiography is enabling and contentious within Asian American women's writings. Examines films to see how such women filmmakers contend with memory, gender, and identity. Cross-listed with GSST 124, and MCS 123.

SEAS 184 The Vietnam Wars 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An introduction to Vietnamese history in the twentieth century. Covers the three Indochina wars (1945-1986) from different Vietnamese perspectives. Topics include experiences during French colonial rule; the anticolonial movements; periods of French and American military involvement up to 1975; the postwar society; and the post-doi moi society. Cross-listed with AST 160, HIST 184, and VNM 184.

SEAS 185 Southeast Asia, Prehistory to 1800 4 Lecture, 3 hours; extra reading, 3. Prerequisite(s): upper-division standing or consent of instructor. Covers the major Southeast Asian historical periods and cultures. Includes prehistory, classical kingdoms, and early modern trading states. Considers the role of ancient stories, religious systems, technologies, and art forms in forming traditional Southeast Asian identities, as well as the influences on these identities from outside the region. Cross-listed with HIST 185 and AST 126.

SEAS 186 Modern Southeast Asia, 1800 to Present 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the formation of modern Southeast Asian nations and cultures since 1800. Compares colonial and postcolonial experiences in the region. Studies the formation of nationalist movements and the relationship of nationalist history with traditional and local histories. Considers the role of the individual, modern media, and global trade in the near-present. Cross-listed with HIST 186, and AST 129.

Graduate Courses

SEAS 200 Topics in Southeast Asian Studies 4 Seminar, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An introduction to the world of Southeast Asia and the scholarly discussions about it, with an emphasis on cultural aspects, embedded in their historical context. Materials are in English. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with ANTH 202 and CPLT 200.

SEAS 201 Musics of Southeast Asia 4 Seminar, 3 hours; term paper, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on historical and ethnographic literature of Southeast Asia and its diasporas. Discusses scholarly literature on music and expressive culture generally, including dance, theater, and ritual. Cross-listed with MUS 272.

SEAS 202 Southeast Asian Religions 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Discusses different and dynamic aspects of religion in various Southeast Asian countries, including Indonesia, Malaysia, Thailand, Cambodia, Vietnam, and the Philippines. Explores contextualized readings featuring historical, anthropological, literary, and other disciplinary perspectives on this diverse region. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topic changes up to 8 units. Cross-listed with ANTH 257 and RLST 253.

SEAS 203 Southeast Asian Cultures 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys ethnographic literature on Southeast Asian cultures, with an emphasis on contemporary research. Covers anthropological approaches to the study of text, ritual, and performance practices; intercultural dynamics; the impact of colonialism and nationalism on traditional cultures; and globalization. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with ANTH 203.

SEAS 204 Approaches to Southeast Asian History 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to central historical problems, historiographical debates, materials, and theoretical approaches in Southeast Asian history. Readings each week focus on a different theme. Course is repeatable to a maximum of 8 units. Cross-listed with HIST 242.

SEAS 205 Literature of Southeast Asia 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores themes and theories related to understanding literature and literary culture in Southeast Asia, insisting that the space of literature reaches beyond the text to include all disciplines. Students critically read, engage in, and question discourses of nationhood, identity, loss, mourning , history, and memoir. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with CPLT 205.

SEAS 206 Southeast Asian Diasporic Literature and Film 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores the contemporary works by Southeast Asian immigrants within the United States and France. Emphasizes the concept that the dynamic production of culture is a negotiation of power and an expression of resistance. Provides an interdisciplinary framework by utilizing historical as well as theoretical works to contextualize the cultural productions. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as content changes to a maximum of 12 units.

SEAS 243A Research Seminar in Southeast Asian History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Discusses Southeast Asian topics from regional, comparative, and local perspectives. May be taken as a one- or two-quarter course (HIST 243A/SEAS 243A, HIST 243B/SEAS 243B). After completing both HIST 243A/SEAS 243A and HIST 243B/SEAS 243B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Cross-listed with HIST 243A.

SEAS 243B Research Seminar in Southeast Asian History 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; HIST 243A/SEAS 243A. Discusses Southeast Asian topics from regional, comparative, and local perspectives. Students produce a substantial research paper that continues their work from HIST 243A/SEAS 243A. May be taken as a one- or two-quarter course (HIST 243A/SEAS 243A, HIST 243B/SEAS 243B). After completing both HIST 243A/SEAS 243A and HIST 243B/SEAS 243B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Cross-listed with HIST 243B.

SEAS 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): consent of instructor and graduate advisor. Directed study to meet special curricular needs. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SEAS 292 Concurrent Analytical Studies in Southeast Asian Studies 1 to 4 Individual Study, 3 to 12 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Taken concurrently with a 100-series course, but on an individual basis. Devoted to research, criticism, and written work at the graduate level related to the 100-series course. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SEAS 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): consent of instructor; graduate standing. Individualized research under the sponsorship of specific faculty members. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SEAS 299 Research For the Thesis 1 to 12 Thesis, 3 to 36 hours. Prerequisite(s): graduate standing; and consent of thesis director. Research and preparation for the thesis. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Southeast Asian Studies Designated Emphasis

Subject abbreviation: SEAS
College of Humanities, Arts, and Social Sciences

seatrip.ucr.edu

Committee in Charge

Muhamad Ali, Ph.D. (Religious Studies)
David Biggs, Ph.D. (History)
Charmaine Craig, M.F.A. (Creative Writing)
Weihsin Gui, Ph.D. (English)
Tamara Ho, Ph.D. (Gender and Sexuality Studies)
Mariam Beevi Lam, Ph.D. (Comparative Literature and Foreign Languages)
Sally A. Ness, Ph.D. (Anthropology)
Victoria Reyes, Ph.D. (Sociology)
Maria Sarita See, Ph.D. (Media & Cultural Studies)
Christina Schwenkel, Ph.D., Chair (Anthropology)
Rican Vue, Ph.D. (Education)
Deborah A. Wong, Ph.D. (Music)

The Designated Emphasis in Southeast Asian Studies, a specialization that includes new methods of inquiry in conjunction with a student's disciplinary field of interest, is awarded in addition to a Ph.D. degree.

A total of 16 units of coursework is required:

1. **12 units of course work in SEAS, from at least two departments**
   a. 4 units in (required) ANTH 202/ CPLT 200/SEAS 200
   b. Choose the additional 8 units from the lists below

Graduate Seminars:
ANTH 257/ RLST 253/ SEAS 202, ANTH 203/ SEAS 203, HIST 242/ SEAS 204, CPLT 205/ SEAS 205, SEAS 206, SEAS 243A, SEAS 243B

Upper Division Undergraduate Courses:
MCS 130/SEAS 130, ANTH 136/SEAS 136, ETST 137/ SEAS 137, ETST 143A/SEAS 143A, ETST 143B/SEAS 143B, ANTH 140I, RLST 145/SEAS 145, RLST 149/ SEAS 149, RLST 150/SEAS 150, AST 161/SEAS 161, AST 162/HIST 187/SEAS 162/VNM 162, AST 163/ CPLT 163/SEAS 163, AST 164/SEAS 164/VNM 164, AST 165 (E-Z)/GSST 165 (E-Z)/SEAS 165 (E -Z)/VNM 165 (E-Z), AST 166/CPLT 166/SEAS 166/VNM 166, AST 167/CPLT 167/SEAS 167, GSST 122/MCS 142/ SEAS 172, GSST 124/MCS123/SEAS 175, AST 187/ MCS 167/SEAS 177, AST 160/HIST 184/SEAS 184/ VNM 184, AST 26/HIST 185/SEAS 185, AST 129/HIST 186/SEAS 186, AST 189/HIST 189/SEAS 189/VNM 189, ANTH 176/AST 127/DNCE127/ETST 172/MUS 127

2. **4 units of Thesis Study (SEAS 299) or directed Research (SEAS 297) resulting in a paper supervised by a member of the Southeast Asian Studies Program.**

Courses taken for the Designated Emphasis cannot be used toward the Ph.D. Language proficiency is preferable, though not required.

Speculative Fiction and Cultures of Science Minor

Subject abbreviation: SFCS
College of Humanities, Arts, and Social Sciences

Committee in Charge

andré carrington (English)
Gloria Kim (Media and Cultural Studies)
Eric Schwitzgebel (Philosophy)
Dana Simmons (History)
Sheryl Vint (English / Media and Cultural Studies)

Supporting Faculty

Derek Burrill (Media and Cultural Studies)
andré carrington (English)
John Jennings (Media and Cultural Studies)
Gloria Kim (Media and Cultural Studies)
Stuart Krieger (Theatre, Film, and Digital Production)
Tim Labor (Media and Cultural Studies)
Juliette Levy (History)
Yolanda Moses (Anthropology)
Lisa Raphals, (Comparative Literature)
Judith Rodenbeck (Media and Cultural Studies)
Richard Rodriguez (Media and Cultural Studies)
Robin Russin (Theatre, Film and Digital Production)
Chikako Takeshita (Gender and Sexuality Studies)
James Tobias (English)
Susan Zieger (English)

The minor in Speculative Fiction and Cultures of Science explores intersections among speculative fiction, science and technology studies (STS), and traditions of speculative thought. We study the pervasive role of speculative discourses in public culture, investigating the complex and reciprocal exchanges among futuristic discourses, research agendas, public policy decisions, media texts, and daily life in technologically saturated societies. Using the combined perspectives of cultural studies and STS helps students develop critical literacy about their media-dominated landscape through which to understand its discourses of science and the future. Bringing speculative fictions and STS into dialogue, our scholars focus on understanding technological change in specific contexts by analyzing the texts and practices that have responded to, critiqued, and build upon the ways science shapes our cultural, material, and economic milieu. Speculative thinking and speculative fictions are central to many of the most compelling contemporary research concerns, such as the Anthropocene, climate change, genetic engineering, and discourses of the posthuman. We examine the histories and cultures of science, technology, and medicine to understand the role culture plays in the production of science and the reciprocal way changes in science and technology shape culture. Our program uniquely emphasizes the role of popular culture and the genres of speculative fiction, in particular, for serving as an imaginative testing ground for technological innovation, articulating hopes and anxieties regarding technological change, and mediating public understandings of science and its applications.

1. **Requirements (24 units)**
   a) Four (4) units from SFCS 001 or from the approved substitutes ENGL 146/ MCS 146 or ANTH 162.
   b) Sixteen (16) additional units, selected from the following groups. Students must take at least four (4) units from two of the three groups.

   GROUP ONE: Fine Arts; selected from CRWT 162; CRWT 172; MCS 146; MCS 133; MCS 151G; MCS 153 (E-Z); MCS 170; TFDP 166C.

   GROUP TWO: Humanities; selected from CPLT 118; CPAC 132; ENGL 179A; ENGL 179SA; ENGL 179B; ENGL 179C; JPN 184; HIST 105; HIST 107/SEHE 173; HISA 147; MCS 109; MCS 147; MCS 149; MCS 157; MCS 158; MCS 166; MCS 175; PHIL 137; PHIL 167.

   GROUP THREE: Social Sciences; selected from ANTH 144F; ANTH 144E; GSST 106; GSST 161; GSST 185; GSST 187; GSST 189.

   c) Four (4) units from SFCS 193 (senior seminar) or CPLT 193 or ENGL 189 or MCS 193 or PHIL 193

All students must take the introductory course (SFCS 001) and the senior seminar or approved equivalents listed above. There is no required order in which elective courses must be taken but credit in SFCS 001 is required for entry into SFCS 193.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for information on minors.

Lower-Division Courses

SFCS 001 Introduction to Speculative Fiction and Cultures of Science 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): none. Investigates the relationship among science, technology, medicine, and the genre of science fiction. Emphasizes exchanges between technology and popular culture. Covers fiction by H.G. Wells, Kim Stanley Robinson, and Nancy Kress and critical readings by Steven Shafer, Donna Haraway, and Bruno Latour.

Upper-Division Courses

SFCS 123 Reclaiming the Dark: Black Life Is Speculative Fiction 4 Lecture, 3 hours; activity, 2 hours; extra reading, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores alternative states of being, doing, and imagining in, around, and through Black life and culture. Covers writers, artists, and activists such as Octavia Butler, Toni Morrison, Cedric Robinson, the Combahee River Collective, N. K. Jemisin, Adrienne Maree Brown, Kevin Quashie, Nnedi Okorafor, and Ursula K. Le Guin. Cross-listed with BLKS 123.

SFCS 193 Senior Seminar in Speculative Fiction and Cultures of Science 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): SFCS 001; or consent of instructor. Develops skills in the formulation and investigation of research questions in science fiction and technoculture studies. Synthesizes and integrates knowledge and skills obtained in the minor. Includes a major research project and presentations by guest speakers.

Speculative Fiction and Cultures of Science Designated Emphasis

Subject abbreviation: SFCS
College of Humanities, Arts, and Social Sciences

andré carrington (English), Director
andre.carrington@ucr.edu

Advisory Committee & Participating Faculty

Derek Burrill (Media and Cultural Studies)
Tamara Ho (Gender and Sexuality Studies)
John Jennings (Media and Cultural Studies)
Gloria Kim (Media and Cultural Studies)
Stuart Krieger (Theatre, Film and Digital Production)
Tim Labor (Music and Media and Cultural Studies)
Juliette Levy (History)
Juliet McMullin (Anthropology)
Yolanda Moses (Anthropology)
Lisa Raphals (Comparative Literature & Foreign Languages)
Judith Rodenbeck (Media and Cultural Studies)
Richard Rodriguez (Media and Cultural Studies)
Dana Simmons (History)
Eric Schwitzgebel (Philosophy)
Chikako Takeshita (Gender and Sexuality Studies)
James Tobias (English)
Sherryl Vint (English / Media and Cultural Studies)
Susan Zieger (English)

Designated Emphasis Requirements

The Designated Emphasis is a 12-unit interdisciplinary graduate course of study, requiring coursework across at least two departments. Two of the three required courses, if otherwise eligible, may count towards the student's Ph.D. requirements.

1. All students must complete a ENGL 297 graduate course (4 units) with an affiliated faculty member that produces an approximately 25-page research paper. This course will fulfill the research requirement of the Designated Emphasis.
2. Two (2) courses (8 units) selected from ANTH 262, CPLT 272, CPLT 273, CPLT 275, CPLT 276, CWPA 255, ENGL 246, ENGL 247, ENGL 248, ETST 243F, HIST 287A, MUS 251, MUS 264, and PHIL 237. Students may ask to count another course with relevant content as approved by the Designated Emphasis Director. Students must select courses from at least two different departments or programs, one of which may be their home department. Undergraduate courses taken to fulfill these requirements must be accompanied by a 292 course with extra work mutually agreed upon by professor and student.

All requirements for the Designated Emphasis must be satisfied before a student advances to candidacy in their Ph.D. field; a minimum GPA of 3.0 is required for the award of the Designated Emphasis.

Statistics

Subject abbreviation: STAT
College of Natural and Agricultural Sciences

Yehua Li, Ph.D., Chair
Department Office
1337 Olmsted Hall
statistics.ucr.edu

Business Office
(951) 827-3774

Graduate Student Affairs
1140 Batchelor Hall
(951) 827-4716 or (800) 735-0717
stat@ucr.edu

CNAS Undergraduate Advising Center
1223 Pierce Hall
(951) 827-7294

Professors

Xinping Cui, Ph.D.
James M. Flegal, Ph.D.
Daniel R. Jeske, Ph.D.
Jun Li, Ph.D.
Yehua Li, Ph.D.
Shujie Ma, Ph.D.
Weixin Yao, Ph.D.
Shuheng Zhou, Ph.D

Professors Emeriti

Barry C. Arnold, Ph.D., *Distinguished Professor*
Subir Ghosh, Ph.D.
Keh-Shin Lii, Ph.D.
David J. Strauss, Ph.D.

Associate Professors

Analisa Flores, Ph.D.
Esra Kürüm, Ph.D.
Wenxiu Ma, Ph.D.
Wei Vivian Li, Ph.D.

Assistant Professors

Xu Cao, Ph.D.
Yuzhou Chen, Ph.D.
Zhe Fei, Ph.D.
Yingzuo (Joyce) Fu, Ph.D.
Salil Koner, Ph.D.
Alfonso Landeros, Ph.D.
Suqi Liu, Ph.D.
Xiaoqian Liu, Ph.D.
Jose Angel Sanchez Gomez, Ph.D.
Jeffrey Zhang, Ph.D.

Lecturers Emerita

Barbara Beaver, M.S.
Linda M. Penas, Ph.D.

Major

The Department of Statistics is concerned with teaching, research, and statistical consulting. The courses offered present a comprehensive spectrum of statistical and probability theory, in so far as such theory is necessary for the understanding and analysis of observational data. The applications of the theory delineated in the courses may be made in any field of experience. Laboratory classes in which examples related to the student's actual field of interest are worked out, play an essential part. The department offers both B.A. and B.S. degrees in Statistics as well as a B.S. in Statistics with options in Statistical Computing and Quantitative Management; the M.S. degree in Statistics; and the Ph.D. degree in Applied Statistics.

The courses STAT 004, STAT 005, STAT 008, STAT 010, STAT 011, STAT 104/BUS 104, STAT 110, STAT 130, STAT 140, STAT 146, and STAT 155 are intended for students of other departments who wish a knowledge of statistical techniques. Some of them may be taken as electives by statistics majors. The objective of these courses is to acquaint the student with the elements of statistics with only the necessary amount of mathematical training.

The courses STAT 107, STAT 157 and STAT 167 are computer-oriented courses intended for students who would like to learn about computer programming in the most important languages and who would like to learn about statistical computing.

Transfer Students

Students transferring to the Statistics major must complete courses comparable to the following one-year sequence before they transfer:

1. First-year calculus, equivalent to MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC, each course completed with a grade of "B-" or better.

Computing Laboratories

The department has two large undergraduate Windows-based teaching laboratories. These laboratories provide users access to a wide variety of statistical software packages including SAS, R, Minitab, and SPSS, and other popular software packages including Mathematica, Adobe Acrobat, and Microsoft Office. The department also houses the Garber Research Computing Laboratory, which is a combination of a UNIX/LINUX-based system with multiple workstations and several Windows-based machines.

Statistical Consulting Center

The Statistical Consulting Collaboratory provides a broad range of analytical and statistical support services, including design of experiments, statistical inference, hypothesis testing, and data modeling for the campus community, and promotes cooperative research between statisticians and other investigators in all fields of the application of statistics. The Collaboratory is staffed by:

Yehua Li, Ph.D., Faculty Director; Karen Huaying Xu, Ph.D., Associate Director; Xinping Cui, Ph.D., Faculty Advisor; and rotating graduate students.

Change of Major Criteria

All courses taken to fulfill major requirements must be completed with grades of "C-" or better after repeats.

Freshman (0-44.9 units earned)

Completion of the following with grade of "C-"or better and must be in good academic standing. (2.0 quarter and cumulative GPA)

- MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB

Sophomores (45-89.9 earned units)

Completion of the following with grade of "C-"or better and must be in good academic standing. (2.0 quarter and cumulative GPA)

- MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC

4 (four) additional units of college-level Mathematics or Statistics (STAT 010 recommended)

Juniors (90-134.9 earned units)

Completion of the following with grade of "C-"or better and must be in good academic standing. (2.0 quarter and cumulative GPA)

- MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC, STAT 010, STAT 011

8 (eight) additional units of college level Mathematics or Statistics (MATH 031 and STAT 107 recommended)

Seniors (135 or more earned units)

Completion of the following with grade of "C-"or better and must be in good academic standing. (2.0 quarter and cumulative GPA)

- MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC, MATH 031, STAT 010 (or equivalent), STAT 011 (or equivalent), STAT 107, STAT 160A (or equivalent), STAT 160B (or equivalent)

Major change requests are reviewed during the 2nd, 3rd, 4th & 10th weeks of each quarter.

Transfer Selection Criteria

Applicants to majors in the College of Natural and Agricultural Sciences are selected on the basis of academic preparation, as assessed by their GPA and the strength of preparation for the intended major. A GPA of at least 2.70 is required. (This is a baseline GPA for consideration and not a guarantee of admission.)

In addition, applicants will need to complete college courses comparable to at least two of the following UCR year-long sequences in order to meet selection criteria for this major. Courses must be completed with "C" grades or better:

- MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, and MATH 009C or MATH 09HC (mandatory). A grade of "B-" or better is required in this series.

And at least one sequence from:

1. BIOL 005A, BIOL 05LA or BIOL 020 and BIOL 005B (and BIOL 005C, if articulated)
2. CHEM 001A, CHEM 01LA, CHEM 001B, CHEM 01LB, CHEM 001C, and CHEM 01LC
3. Organic chemistry (one-year lower-division), each course completed with a grade of "B" or better
4. PHYS 002A, PHYS 02LA, PHYS 002B, PHYS 02LB PHYS 002C, and PHYS 02LC
5. PHYS 040A, PHYS 040B, and PHYS 040C
6. MATH 010A and MATH 010B, or one course in linear algebra.

Courses must be completed with a letter grade, with no grade lower than a "C." Students should visit assist.org for updated and comprehensive major preparation requirements.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college's breadth requirements. Consult with a department advisor for course planning.

Major Requirements

The department offers both a B.A. and a B.S. degree in Statistics as well as a B.S. in Statistics with options in Statistical Computing and Quantitative Management.

The major requirements for the B.A. and the B.S. degrees in Statistics are as follows:

For the Bachelor of Arts

1. **Core requirements (34–38 units)**
   a) CS 010A
   b) One math sequence from the following:
      (i) MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC
      (ii) MATH 005A, MATH 005B, MATH 005C
   c) MATH 010A, MATH 031
   d) STAT 010, STAT 011
2. **Upper-division requirements (36–37 units)**
   a) Thirty-two (32) units of upper-division course work to include twenty-eight units in (1) and four units in (2).
      (1) STAT 107, STAT 160A, STAT 160B, STAT 160C, STAT 169, STAT 170, STAT 171
      (2) Four (4) units of STAT 183 taken during senior year
   b) Four (4) units of additional coursework chosen from STAT 110, BUS 127/STAT 127, STAT 130, STAT 140, STAT 146, STAT 157, STAT 161, STAT 167 or from related fields with the approval of the major advisor.

For the Bachelor of Science

1. **Core requirements (34–38 units)**
   a) CS 010A
   b) One math sequence from the following:
      (i) MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB, MATH 009C or MATH 09HC
      (ii) MATH 005, MATH 005B, MATH 005C
   c) MATH 010A, MATH 031
   d) STAT 010, STAT 011
2. **Upper-division requirements (52–53 units)**
   a) Thirty-two (32) units of upper-division course work to include twenty-eight units in (1) and four units in (2)
      (1) STAT 107, STAT 160A, STAT 160B, STAT 160C, STAT 169, STAT 170, STAT 171
      (2) Four (4) units of STAT 183 taken during senior year
   b) Twenty (20) units of additional course work chosen from STAT 110, STAT 127/BUS 127, STAT 130, STAT 140, STAT 146, STAT 157, STAT 161, STAT 167 or from related fields with the approval of the major advisor.

Statistical Computing Option

The requirements for this option are in addition to the requirements for the B.S. in Statistics, except that the option requirement takes the place of the 20 units in 2.b) under Upper-division requirements for the B.S. in Statistics.

1. **Lower-division requirements (8 units):** CS 010B, CS 010C
2. **Upper-division requirements (16 units)**
   a) STAT 167
   b) Twelve (12) units of coursework selected from
      (1) CS 100, CS 111, CS 141, CS 177
      (2) MATH 120, MATH 135A, MATH 135B

Quantitative Management Option

The requirements for this option are in addition to the requirements for the B.S. in Statistics, except that the option requirement takes the place of the 20 units in 2.b) above.

1. **Lower-division requirements (18 units)**
   a) ECON 002, ECON 003 or ECON 003H
   b) BUS 020
   c) one of the following:
      (i) BUS 010
      (ii) BUS 021, optional for any area but required for those who choose area (3) Accounting under 2.b below
2. **Upper-division requirements (16 units)**
   a) BUS/STAT 104
   b) Three courses from one area:
      (1) **Marketing:** BUS 103 and two other courses from BUS 111, BUS 112, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119
      (2) **Finance:** BUS 106 and two other courses from BUS 138, BUS 139, BUS 140
      (3) **Accounting:** BUS 108, BUS 165A, BUS 165B, BUS 168A, BUS 168B, BUS 169A
      (4) **Management:** BUS 143, BUS 144, BUS 145, BUS 149, BUS 150
      (5) **Information Systems:** BUS 101 and two other courses from BUS 171, BUS 173, BUS 174, BUS 175

(6) **Operations & Supply Chain Management:** BUS 122, BUS 123, BUS 124, BUS 125, BUS 126, BUS 128, BUS 130

Minor

The minor in Statistics is designed to give students in either the social sciences or the physical sciences a cohesive set of statistics courses to deal with the data analytic aspects of their disciplines and to understand the statistical summaries that are encountered in everyday activities.

The following are the requirements for the minor in Statistics.

1. Lower-division requirements (10 units): STAT 010, STAT 011
2. Upper-division requirements (24 units):
   a) STAT 107
   b) STAT 156A or STAT 160A, STAT 156B or STAT 160B
   c) Twelve (12) units of upper-division statistics courses excluding STAT 155.

Of the specified upper-division units, a minimum of 16 must be unique to the minor and may not be used to satisfy major requirements.

No more than 4 units may be in courses numbered 190 through 199.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Joint B.S.+1 Statistics M.S. Program

The College of Natural and Agricultural Science offers a combined B.S.+1 Statistics M.S. program, designed to allow successful B.S. graduates who have taken some graduate level statistics courses in their senior standing year in UCR to complete the Master of Science degree in Statistics in one year, by allowing up to 12 units of graduate level coursework taken in UCR as an undergraduate to be counted towards the MS degree requirements.

A student should apply for the B.S.+1 Statistics M.S. program (including transfer students) before the start of their senior standing year. To apply, the student must have a cumulative GPA at least 3.0 overall, 3.3 GPA in the statistics major, and have completed STAT 160ABC with GPA at least 3.3 in STAT 160ABC sequence.. These are minimum requirements and do not guarantee the admission. The application to the B.S.+1 M.S. program must include a transcript, and at least two recommendation letters. Submission of GRE scores with the application is recommended but not required. During students' senior year, students must apply via the Graduate Division for the M.S. portion. Matriculation into the graduate portion of the B.S.+1 M.S. program occurs in the Fall term following their final year, provided: (a) the M.S. application is accepted, (b) throughout the final undergraduate year at UCR the student has a cumulative GPA 3.0 or higher, (c) by the end of senior standing year, the student completes the B.S. degree requirements.

Incoming freshman students who apply to the Statistics B.S. program may simultaneously apply for preliminary conditional admission into the B.S.+1 Statistics M.S. program provided their high-school GPA is at least 3.6, they satisfy the Entry-Level Writing requirement prior to matriculation, and they are eligible to enroll in or to receive credit for MATH 7A or MATH 9A upon arrival or in their first quarter.

Preliminary conditional admission status is maintained as long as the student is a Statistics B.S. student in good standing with a cumulative GPA of at least 3.0. Conditionally admitted students still need to apply for full admission by the start of their senior standing year as described above and apply via the Graduate Division for the MS portion. Continuing undergraduate students who meet the above criteria may apply to the program by submitting a petition and should confer with their staff advisor for details.

To earn the MS degree, students are required to complete a minimum of 41 units that must include STAT 201A, 201B, 201C, STAT 202A, 202B, 202C, STAT 207, STAT 208, STAT 288, and two quarters of STAT 293, and pass the written exam. No more than 12 units earned prior to matriculation to graduate status can be applied towards the MS degree requirements. The courses that can be double counted must be graduate level courses and be eligible to be counted as electives in the B.S. requirements. Students receive credit toward the 41 units by completing STAT 201ABC (recommended) or some other graduate level courses, approved by the graduate advisor, as an undergraduate senior.

Comprehensive Examination

All M.S. students are required to take a written comprehensive examination and pass at the M.S. level, with no more than two attempts allowed to pass. A program proposal is not required.

Advancement to Candidacy

Advancement for the master's candidacy occurs at the beginning of the quarter the student plans to graduate.

Professional Development

Students in the Statistics B.S.+1 M.S. Program must register two quarters of STAT 293, which give students training in (a) the ability to use fundamental statistical techniques to formulate problem and solution in diverse real-world application; (b) the ability to use at least one statistical software package to conduct statistical data analysis; (c) the ability to communicate with researchers in statistical community and other disciplines by using graphical methods to display and interpret information.

Normative time

The normative time to B.S. is four years, and the normative time of the MS portion is one year (five years total).

Graduate Programs

The Department of Statistics offers the M.S. degree in Statistics and the Ph.D. degree in Applied Statistics.

Admission

Domestic and international applicants applying to the M.S. and Ph.D. program may submit GRE General Test scores (verbal, quantitative, and analytical), but it is not a requirement. In addition, TOEFL scores must be supplied by applicants whose first language is not English who do not hold a degree from a U.S. institution. The department considers applications for teaching assistantships at the same time as those for fellowships. Normally, Ph.D. eligible admitted students are awarded five year financial assistantship.

Master's Program

The Department of Statistics offers the M.S. degree in Statistics.

Admission

Students entering the Master's program must have completed a bachelor's degree with sufficient training in Mathematics and a strong background in Statistics or have taken STAT 160A, STAT 160B, STAT 160C, STAT 161 and STAT 169, STAT 170, STAT 171, covering basic areas of probability and statistics.

Students must also meet the other requirements for admission as specified by the Graduate Division. The program is Plan II (Comprehensive Examination) described in the Graduate Studies section of this catalog. No foreign language is required.

Course Work

Graduate students in Statistics must have taken appropriate courses in Mathematics to give them the proper background for graduate work in Statistics. Important areas include Calculus (at least MATH 009A, MATH 009B, MATH 009C, and MATH 010A) and Linear Algebra (at least MATH 131).

Degree Requirements

Each student must complete 41 units of coursework that must include STAT 201ABC, STAT 202ABC, STAT 207, STAT 208, STAT 288, and two consecutive quarters of STAT 293.

Our MS program is course-based, so the completion of oral qualifying exams and thesis defense are not required by our MS program.

Comprehensive Examination

All M.S. students are required to take a written comprehensive examination and pass at the M.S. level, with no more than two attempts allowed to pass. The written qualifying exam is offered two times in each year, the first in Summer and the second in Fall quarter. All students in the program are required to take their first attempt of the exam in Summer. The second exam in Fall can only be taken by the students· who fail to pass the exam in their first attempt. Exceptions can be made based on the approval of Graduate Advisor. A program proposal is not required.

Advancement to Candidacy

Advancing to candidacy takes place when students complete all the course requirements and pass the written exam.

Professional Development Requirement:

Two quarters of STAT 293 give students training in (a) the ability to use fundamental statistical techniques to formulate problem and solution in diverse real-world application; (b)the ability to use at least one statistical software package to conduct statistical data analysis; (c) the ability to communicate with

researchers in statistical community and other disciplines by using graphical methods to display and interpret information.

Petition to Change Degree Objective
Some students can petition to change their degree objective from the M.S. degree to the Ph.D. program in Applied Statistics depending on their performances in the written comprehensive exam and coursework.

The Master of Science in Business Analytics (MSBA)

The Master of Science in Business Analytics (MSBA) program is designed to extend the training of students with analytical backgrounds in business or statistics to allow them to apply their skills to business data. Increasingly large amounts of data are available about customers, costs, and suppliers, which can be analyzed to improve operations, increase the yield on marketing programs and understand pricing and financing better, which all add to the value of the business.

The MSBA interdepartmental program is offered by the School of Business and the Department of Statistics. Depending on the curriculum track, the degree requires 48 to 49 units of study, which can be done as a full-time one-academic-year program or over a longer period on a part- time basis.

Admission
To ensure that students have the prior knowledge to succeed in the program, admission is limited to applicants who have studied statistics or another quantitative discipline such as mathematics, physics, engineering, computer science, or economics or another quantitative discipline such as mathematics, physics, engineering, computer science, or economics or a quantitative business discipline (such as operations, finance and marketing) as undergraduates. Applicants to the program must have completed a bachelor's degree or its approved equivalent in one of these four disciplines. Students who have weaker statistical training but otherwise show promise will be required to take STAT 171 or similar courses before entering the program. Applicants who do not have an undergraduate degree in statistics or one of the quantitative business disciplines may be considered for admission if they provide sufficient evidence of appropriate training.

Applicants must have received their undergraduate degrees from an accredited institution, and have attained a record that satisfies the standards established by the Graduate Division and University Graduate Council.

All applicants must submit scores from the Graduate Management Admissions Test (GMAT) or Graduate Record Exam, General Test (GRE). Applicants whose first language is not English are required to submit acceptable scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) unless they have a degree from an institution where English is the exclusive language of instruction. Additionally, each applicant must submit at least two letters of recommendation, at least one of which must be an academic reference. All other application requirements are specified in the graduate application or in the General UCR catalog.

Course Work
Once admitted, students follow one of three tracks:

- Statistics Academic Track (48 units)
- Business Academic Track (48 units)
- Practicum Track (49 units)

The statistics academic track and the business academic track offer alternative academic preparation pathways. The practicum track augments either of those academic tracks with a one-unit internship. The statistics academic track is for students who studied a quantitative discipline other than statistics or one of the business disciplines as undergraduates (finance, operations, or marketing) and the business academic track is for students who focused on statistics as undergraduates. Students opting for the third practicum track will follow either the statistics or the business track depending on their academic background as described above, and in addition, are required to undertake an internship (MGT 298I – 1 unit) to fulfill track requirements. All tracks culminate in a two-quarter capstone class that applies their understanding of business analytics to a project.

Required courses

1. MGT 256 Business Analytics for Management
2. MGT 286A-B Capstone in Business Analytics
3. STAT 208 Statistical Data Mining Methods
4. STAT 232 Statistics for Business Analytics

Business Academic Track (Choose any four from the following five courses):

5. MGT 202 Financial Management
6. MGT 204 Cost and Management Accounting
7. MGT 207 Operations Management
8. MGT 209 Marketing Management
9. STAT 206 Statistical Computing

Statistics Academic Track:

5. **Choose one of the following:**
   MGT 202 Financial Management ***or***
   MGT 204 Cost and Management Accounting ***or***
   MGT 207 Operations Management ***or***
   MGT 209 Marketing Management
6. MGT 219 Spreadsheet Modeling for Decision-Making ***or***
   MGT 267 Applied Business Forecasting
7. STAT 200 Foundational Methods for Business Analytics
8. STAT 206 Statistical Computing

Concentrations
Students choose a set of three courses in either marketing, operations or finance. These concentration courses provide depth to the student's understanding of the area in which they will carry out a capstone course project.

Marketing:

1. MGT 228 Consumer Behavior **or**
   MGT 257 Marketing Strategy
2. MGT 251 Market Analytics
3. MGT 253 Digital Marketing

Operations:

1. MGT 219 (Spreadsheet Modeling for Decision-Making)
2. MGT 239 Simulation for Business
3. MGT 258 Logistics and Supply Chain Management

Finance:

1. MGT 227 Fixed Income Securities and Markets **or**
   MGT 244 Corporate Risk Management
2. MGT 232 Derivatives and Asset Pricing
3. MGT 252 Investments and Portfolio Management **or**
   MGT 295F Empirical Methods in Finance

Professional Development Requirement:

1. MGT 286B gives students training in
   (a) the ability to use fundamental statistical techniques to formulate problems and solutions in diverse real-world applications;
   (b) the ability to use at least one statistical software package to conduct statistical data analysis;
   (c) the ability to communicate with business managers about statistical data by using graphical methods in conjunction with written analysis to describe and interpret information.

Plan I (Thesis) is not an option for the MSBA degree program.

Plan II (Comprehensive Examination)
requires that at least 18 units be in graduate level courses taken at a UC campus. None of these may be in courses numbered 297 or 299. Every candidate must take a comprehensive examination, the content of which is determined by the program. Candidates for the degree are required to complete all of the general requirements specified by Graduate Studies. The program is intended to conform to Plan II.

Normative Time
One year for full-time students; Two years for part-time enrollees.

Doctoral Degree

The Department of Statistics offers the Ph.D. degree in Applied Statistics.

The program emphasizes both the theory of statistics and its application to special fields of interest. In addition to courses in statistics, a student would take courses in a substantive field from which a thesis problem requiring a statistical approach should arise. The substantive field may be chosen from areas such as biology, economics, political science, psychology or administration. Specialties might include, for example, population genetics, biological control, hydrology, epidemiology, geology, discrimination in learning, or scales and measurements.

Admission
Students entering the program must have completed either a bachelor's degree or a Master's degree in Statistics, Computer Science, Mathematics, or some other quantitatively based discipline. Students lacking sufficient preparation for some statistics graduate classes must complete some preparatory work in Statistics, Computer Science, or Mathematics

depending on their background. Students also have to meet the general requirements listed in the Graduate Studies section of this catalog.

Change Degree Objective
Students with a Bachelor's degree in the Ph.D. program who have satisfied all the requirements for the Master's degree may apply for this degree while completing requirements for the Ph.D. program.

Ph.D. Course Requirements

I. Course Requirements
   (A) Core: STAT 202A, STAT 202B, STAT 202C, STAT 207, STAT 208, STAT 210A, STAT 210B, STAT 288, and two consecutive quarters of STAT 293.
   (B) 24 units of additional 200 level Statistics courses not graded S/NC, excluding STAT 201A, STAT 201B, STAT 201C, STAT 231A and STAT 231B.
   (C) Substantive: Four units (or equivalent) in substantive field with a minimum GPA of 3.00 appropriate to the student's interest. The requirement may be waived if the student already has the background in the substantive area.
   (D) Nine units of STAT 251 Statistics Colloquium before graduation.

II. Teaching: At least three quarters of teaching service.

III. Miscellaneous: In preparation for the written qualifying examinations, a student can register for up to 6 units of STAT 291 (Individual Studies in Coordinated Areas) only during quarters that the student actually participates in qualifying examinations.

Foreign Language Requirement None

Written and Oral Qualifying Examination
All Ph.D. students are required to take a written qualifying examination and pass at the Ph.D. level, with no more than two attempts allowed to pass. The written qualifying exam is offered two times in each year, the first in Summer quarter and the second in Fall quarter. Students who start coursework with STAT 210A take the first attempt at the written exam Summer quarter before the start of their second year. Students who start coursework with STAT 201A take the first attempt at the written exam in Summer quarter before the start of the third year. The second exam can only be taken by students who fail to pass the exam in their first attempt. Students must take the second attempt in the Fall quarter immediately following the Summer quarter of the failed attempt. Exceptions can be made based on the approval of the Graduate Advisor. After passing the written exam the student will work with advisor to prepare for the oral examination.

Advancement to Candidacy
Oral Qualifying Exam must be completed no later than the end of Year Three of the student's graduate training. Exceptions can be made based on the approval of Graduate Advisor. Advancing to candidacy takes place when students complete all the course requirements and pass the written and oral exams.

Dissertation
The dissertation is pertinent to a problem area specified by the candidate's substantive field and is submitted in accordance with the requirements of the Graduate Division, Riverside.

Candidates must successfully defend their dissertation research in a public oral presentation, selecting one of the modalities.

Oral Qualifying Exam and Final Defense Modality for the Ph.D. degree:
The modalities will be as follows, **In-Person, Hybrid or Remote**:

Students taking the oral qualifying exam/presenting a final defense **in person** are expected to present on campus with all committee members physically present.

Students taking the oral qualifying exam/presenting a final defense **hybrid**, have the option for some committee members/students to attend in-person and some committee members/students to attend remotely.

Students taking the oral qualifying exam/presenting a final defense **remotely**; all participants, students, and committee members can participate remotely.

The Hybrid and Remote options can be selected if the student or faculty member cannot attend in person due to travel or health reasons. The student, in agreement with their committee chairperson, will determine the modality.

Teaching Requirement
All students in the program, for at least three quarters, assist with laboratory (practice) sections of undergraduate Statistics courses or individual tutorial (consultative) work with undergraduate students.

Professional Development Requirement:

1. **STAT 293 gives students training in**
   (a) the ability to use fundamental statistical techniques to formulate problem and solution in diverse real-world application;
   (b) the ability to use at least one statistical software package to conduct statistical data analysis;
   (c) the ability to communicate with researchers in statistical community and other disciplines by using graphical methods to display and interpret information.
2. **Professional writing development:** Students are trained to prepare a research proposal on topics relevant to the student's research area as part of their written qualifying exam.
3. **Pedagogy:** Ph.D. students are required to enroll in Teaching Assistant Development Program (TADP) Orientation in order to TA and enroll in STAT 302 during the quarter they teach. Three quarters of TA experience required.

Normative Time to Degree 15 quarters

Lower-Division Courses

STAT 004 Elements of Data Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Explores basic concepts, algorithms, and techniques of data science with simulation and data visualization. Topics include summarizing and visualizing data using R or Python, causality, randomness, decision making in the presence of uncertainty, prediction, and classification. Credit is awarded for one of the following STAT 004, SEHE 005, or STAT 005. Credit is not awarded for STAT 004 if it has already been awarded for STAT 008, STAT 010, or STAT 011.

STAT 005 Statistics, Health, and Society 4 Lecture, 3 hours; discussion, 1 hour. An introduction to statistics using social, health, and environmental applications. Topics include descriptive statistics; simple linear regression and correlation; probability; discrete and continuous distributions; confidence intervals; hypothesis testing; and one-way analysis of variance. Cross-listed with SEHE 005. Credit is awarded for one of the following SEHE 005, STAT 005, or STAT 004. Credit is not awarded for STAT 005 or SEHE 005 if already awarded to STAT 008, STAT 010, or STAT 011

STAT 008 Statistics For Business 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 004 or MATH 005A or MATH 006B or MATH 007A or MATH 009A or MATH 09HA or MATH 022; or equivalent. An introduction to statistics using business applications. Topics include descriptive statistics; probability; discrete and continuous distributions; Bayes' theorem; random variables; estimation and confidence intervals; hypothesis testing; and simple linear regression. Credit is awarded for one of the following STAT 008 or STAT 010.

STAT 010 Introduction to Statistics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 005A or MATH 006B or MATH 007A or MATH 009A or MATH 09HA. A general introduction to descriptive and inferential statistics. Topics include histograms; descriptive statistics; probability; normal and binomial distributions; sampling distributions; hypothesis testing; and confidence intervals. Credit is awarded for one of the following STAT 010 or STAT 008.

STAT 011 Introduction to Statistical Modeling 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): STAT 008 with a grade of C- or better or STAT 010 with a grade of C- or better. Topics include linear regression, correlation, analysis of variance, and simple experimental designs.

Upper-Division Courses

STAT 104 Decision Analysis and Management Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 008 or STAT 010; or equivalents; or consent of instructor. A survey of deterministic and probabilistic models for decision making. Topics include linear programming and extensions, networks, dynamic programming, decision trees, queuing models, and simulation. Explores the application of these

models in decision making. Cross-listed with BUS 104.

STAT 107 Introduction to Statistical Computing With R 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 008 or STAT 010; or equivalent. An introduction to the R programing language. Topics include data management, basic statistical analysis and graphics, use of functions and packages, simple programming, and reproducible work.

STAT 108 Data Science Ethics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 105 or STAT 107 or CS 171; or consent of instructor. Covers ethics specifically related to data science. Topics include data privacy; data curation and storage; discrimination and bias arising in the machine learning process; statistical topics such as generalization, causality, curse of dimensionality, and sampling bias; data communication; and strategies for conceptualizing, measuring, and mitigating problems in data-driven decision-making. Cross-listed with CS 108. Credit is awarded for one of the following CS 108, STAT 108, CS 212, or STAT 212.

STAT 110 Biostatistical Methods in Life Sciences 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): STAT 011 or STAT 107; or equivalent. Provides undergraduate majors or those interested in life sciences with statistical tools for analyzing different types of data frequently encountered in life sciences. Emphasizes applications of methodology including contingency table analysis, linear regression and ANOVA, maximum likelihood method and the estimation-maximization algorithm, logistic regression, Poisson regression, and survival analysis.

STAT 127 Introduction to Quality Improvements 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 008 or STAT 010; or ECON 101. Explores Deming's 14 points for management, graphical methods, fishbone diagram, Pareto analysis, control charts for attributes and variables, cusum and moving average charts, and process-capability. Also covers economic design, acceptance sampling, Taguchi method, parameter design, tolerance design, reliability, hazard rate, censoring, and accelerated life testing. Cross-listed with BUS 127.

STAT 130 Sampling Surveys 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 011 or STAT 107; or equivalent. Covers simple random sampling, stratified sampling, cluster sampling, and ratio and regression estimates. Also explores random response, capture-recapture, and jack-knife techniques.

STAT 140 Nonparametric Techniques 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 011 or STAT 107; or equivalent. Covers randomization tests, rank tests, methods of association, and distribution-free tests.

STAT 146 Statistical Forecasting Techniques 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 156A or STAT 160A. Topics include exponential smoothing, simple and multiple regression analysis, time series, trend analysis, and seasonal analysis.

STAT 155 Probability and Statistics For Science and Engineering 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C, may be taken concurrently or MATH 09HC, may be taken concurrently or MATH 005C, may be taken concurrently. Covers sample spaces and probability; random variables and probability distributions; elements of statistical inference; and testing and estimation. Also addresses selected topics in multivariate distributions and introduces stochastic processes. Credit is not awarded for STAT 155 if it has already been awarded for STAT 156A or STAT 160A.

STAT 156A Mathematical Statistics With Applications For Data Science I 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C with a grade of C- or better or MATH 09HC with a grade of C- or better or MATH 005C with a grade of C- or better. Introduction to frequentist probability concepts, random variables, and their distributions. Discusses key theorems and inequalities in probability theory. Introduces frequentist methods of point and interval estimation. Credit is awarded for one of the following STAT 156A or STAT 160A.

STAT 156B Mathematical Statistics With Applications For Data Science 2 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 156A with a grade of C- or better. Topics include illustrative applications of Frequentist theory to linear regression; logistic regression and ANOVA; introduction to Bayes' rule, Bayesian probability concepts, and credible intervals; analysis of contingency tables; applications of sequential statistics; and methods for observational studies and missing data. Credit is awarded for one of the following STAT 156B or STAT 160B.

STAT 157 Statistical Computing With Sas 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 010 with a grade of C- or better; CS 009A with a grade of C- or better or CS 010A with a grade of C- or better or STAT 107 with a grade of C- or better; or equivalent. Covers statistical computing with SAS. Topics include syntax and programming logic; data management; basic statistical analysis; statistical graphics; regression; and macros.

STAT 160A Elements of Probability and Statistical Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C, may be taken concurrently or MATH 09HC, may be taken concurrently or MATH 005C, may be taken concurrently. Topics include statistical regularity, probability spaces, fundamental theorems in discrete probability, Bayes' theorem, random variables, densities and distribution functions, and continuous distributions. Credit is awarded for one of the following STAT 160A or STAT 156A.

STAT 160B Elements of Probability and Statistical Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A with a grade of C- or better. Topics include transformations of random variables and central limit theorem, distributions of sample statistics, statistical inference, and estimation. Credit is awarded for one of the following STAT 160B or STAT 156B.

STAT 160C Elements of Probability and Statistical Theory 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160B with a grade of "C-" or better. Topics include hypothesis testing, chi-square tests, and nonparametric methods.

STAT 161 Introduction to Probability Models 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 156B with a grade of C- or better or STAT 160B with a grade of C- or better. Covers compound distributions, branching processes, and random walk. Explores continuous time models such as Poisson process and queuing models. Examines the Markov property and introduces Markov chains. Also covers simple time series models.

STAT 167 Introduction to Data Science 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 107 with a grade of C- or better; CS 009A with a grade of C- or better or CS 010A with a grade of C- or better. Introduction to data science using the R programming language. Topics include big data management, visualization and analytical skills, unsupervised and supervised statistical learning methods, and real-world data science application examples.

STAT 169 Design of Experiments 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 107; STAT 156B or STAT 160B; or equivalent. Topics include principles of design; completely randomized designs; and one-way analysis of variance. Covers complete block designs and two-way analysis of variance; multiple comparisons; and complete factorial experiments. Explores fixed, random, and mixed models; split-plot designs; nested designs; analysis of covariance; sample size determination; and power analysis.

STAT 170 Regression Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 107; STAT 156B or STAT 160B; or equivalent. Topics include simple and multiple linear regression, scatter-plots, and point and interval estimation. Addresses prediction, testing, calibration, interpretation, and practical applications of multiple regression. Explores simple, partial, and multiple correlation; variable selection methods; diagnostic procedures; and regression for longitudinal data.

STAT 171 General Statistical Models 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 170. Covers generalized linear models and least squares, analysis of covariance, nonlinear regression, and nonlinear least squares. Explores regression methods for discrete data including loglinear models, logistic regression, and discriminant analysis. Also addresses regression methods for life data, the Cox survival model, the Kaplan-Meier estimation, and the Mantel-Haenszel test.

STAT 183 Statistical Consulting 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 169; STAT 170; STAT 171; restricted to class level standing of senior. Introduces the statistical

consulting process. Promotes consulting skills including developing effective communication skills, applying statistical methodology to client projects, and learning how to manage time and resources in a consulting environment. Satisfactory(S) or No Credit(N/C) is not available.

STAT 190 Special Studies 1 to 5 hours to be arranged. To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable to a maximum of 10 units.

STAT 197 Research For Undergraduates 2 to 4 Research, 3 to 6 hours; individual study, 3 to 6 hours. Prerequisite(s): restricted to class level standing of junior, or senior; and consent of instructor. An introduction to research in Statistics. Requires a research project completed under the supervision of a Statistics faculty member or a group of faculty members. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) No Credit (NC) grade. Course is repeatable to a maximum of 8 units.

STAT 198I Individual Internship in Statistics 1 to 12 Internship, 2 to 24 hours; research, 1 to 12 hours. Prerequisite(s): restricted to class level standing of junior, or senior; and consent of instructor. An internship to provide statistical field experience in governmental, industrial, or research units. Projects must be approved by the Statistics Department and the head of the unit in which the internship is to be carried out. Requires a written report. Total credit toward graduation may not exceed 12 units. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

STAT 199H Senior Honors Research 1 to 5 Prerequisite(s): senior standing with major concentration in statistics and with consent of instructor. Senior standing with major concentration in statistics and with consent of instructor. Course is repeatable to a maximum of 10 units.

Graduate Courses

STAT 200 Foundational Methods For Business Analytics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 010; restricted to major(s) Business Administration, Business Analytics; graduate standing; or consent of instructor. Introduces the fundamental methods of data analysis, visualization, inference, and prediction needed for business analytics. Provides a working knowledge of using R to perform data analysis.

STAT 201A Theory of Probability and Statistics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B; STAT 160C or equivalent; graduate standing; or consent of instructor. Topics include probability and conditional probability; random variables: univariate and multivariate; distributions; independence; moments; generating functions; transformations, and standard distributions. Also addresses multivariate normal distribution; order statistics; inequalities; convergence concepts; law of large numbers, and the central limit theorem. Credit is not awarded for STAT 201A, if it has already been awarded to STAT 210A if STAT 210A was taken prior to Fall 2013.

STAT 201B Theory of Probability and Statistics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; STAT 201A or equivalent; or consent of instructor. Topics include exponential families; delta method; inference concepts; sufficiency; point estimation; unbiasedness; completeness; and consistency. Also explores relative efficiency; maximum likelihood; method of moments; interval estimation; pivotals; and approximate intervals and regions. Credit is not awarded for STAT 201B if it has already been awarded to STAT 210B if STAT 210B was taken prior to Fall 2013.

STAT 201C Theory of Probability and Statistics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; STAT 201B or equivalent, or consent of instructor. Topics include Bayesian estimation; prior selection; loss functions; admissibility; hypothesis testing; Neyman-Pearson lemma; size; power; UMP tests; likelihood ratio tests; sequential tests; non-parametric tests; and bootstrap. Credit is not awarded to STAT 201C if it has already been awarded to STAT 210C.

STAT 202A Regression, Anova, and Design 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 170; or equivalent; graduate standing; or consent of instructor. Topics include linear regression models; correlations; fitting and prediction; diagnostics; transformations; collinearity; and influential observations. Also addresses model selection; subset selection; Bayesian model selection; regularization; shrinkage methods; and non-parametric and semi-parametric regressions.

STAT 202B Regression, Anova, and Design 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 169, STAT 170 or STAT 202A; or equivalent; graduate standing; or consent of instructor. Topics include fixed effects models with or without interactions; Types 1- 4 ANOVA; multiple testing; ANCOVA; mixed effects models; ML and REML estimation methods; BLUP; multiple crossed and nested factors; analysis of longitudinal data; general linear mixed models; parametric models for covariance structure; and Bayesian ANOVA.

STAT 202C Regression, Anova, and Design 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 169, STAT 170 or STAT 202B; or equivalent; graduate standing; or consent of instructor. Topics include basic principles of experimentation; clinical trials; completely randomized design; power and sample size; randomized block design; Latin square design; factorial experiments; response surface experiments; case control studies; matched case-control studies; choice experiments; and Bayesian design of experiments.

STAT 203A Bayesian Statistics I 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160C or equivalent; graduate standing. Subjective probability, Renyi axiom system, Savage axioms, coherence, Bayes theorem, credibility intervals, Lindley paradox, empirical Bayes estimation, natural conjugate priors, de Finetti's theorem, approximation methods, Bayesian bootstrap, Bayesian computer programs.

STAT 203B Bayesian Statistics 2 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 203A; graduating standing. Assessing priors, nonparametric density estimation for expert group judgements, Bayesian regression, Bayesian analysis of variance, Bayesian regression with correlated disturbances and heteroscedasticity, Bayesian inference in time series models, Bayesian classification, Bayesian inference in spatial statistics, Bayesian factor analysis, disputed authorship.

STAT 204A Advanced Design and Analysis of Experiments 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 202C or equivalent, graduate standing; or consent of instructor. Topics include block, row-column, crossover and repeated measure designs; factorial experiments; confounding; fractional factorials; response surface designs; method of steepest ascent; canonical representation; rotatable, minimum bias, variance, and mean square error designs.

STAT 204B Advanced Design and Analysis of Experiments 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 204A or equivalent, graduate standing; or consent of instructor. Topics include mixture experiments; split-plot; optimum design theory; locally optimal designs; binomial experiments; dose response experiments; group sequential and time sequential design and analysis for failure time end points; adaptive designs.

STAT 205 Discrete Data Analysis 4 Lecture, 3 hours; discussion 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C or equivalents; graduate standing; or consent of instructor. Contingency tables, log-linear models, information theory models, maximum likelihood estimation, goodness of fit, measures of association, computational procedures.

STAT 206 Statistical Computing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160C or consent of instructor. STAT 206 online section; enrollment in the Online-Master-in-Science in Engineering program. Topics include statistical programming, simulation studies, smoothing and density estimation, generating random variables, optimization, Monte Carlo methods, Bootstrap, permutation methods, cross-validation.

STAT 207 Advanced Statistical Computing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 201A and STAT 206 or equivalents; graduate standing; or consent of instructor. Topics include computational aspects of optimization; numerical integration; Advanced Monte Carlo methods; expectation maximization (EM) algorithm; Markov chain and Monte Carlo methods; and other current computational methods.

STAT 208 Statistical Data Mining Methods 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 201A; STAT 201B; STAT 202A; graduate standing; or consent of instructor. Covers principle data-mining

methodologies and applications. Includes Bayes and LDA classifiers, logistic regression and neural network classifiers, support vector classifiers, classification trees, predictive modeling, ridge and lasso regressions, k-means and Dendrogram clustering methods, business analytics, and mining association rules. Features R and SAS programming languages. Credit is awarded for one of the following STAT 208 or ECON 220.

STAT 209 Software Tools For Big Data Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 206, STAT 208; graduate standing; or consent of instructor. Introduction to modern software tools for big data analytics and visualization, supervised and unsupervised statistical learning, database management systems, and parallel and distributed computing. Includes hands-on exercises on the aforementioned topics using R, Python, and SQL. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

STAT 210A Advanced Theory of Probability and Statistics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; STAT 201C or equivalent; or consent of instructor. Topics include measure spaces; measure integration; convergence theorems; absolute continuity; product spaces; Tonelli-fubini theorems; convolutions and transforms; probability spaces; and existence and extension theorems. Also covers inequalities; independence; conditional probability and expectation; convergence concepts; laws of large numbers; weak convergence; and central limit theorem. Credit is not awarded for STAT 201A if it has already been awarded to STAT 210A if STAT 210A was taken prior to Fall 2013.

STAT 210B Advanced Theory of Probability and Statistics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 210A; graduate standing. Topics include estimation, decision theory, Bayes and empirical Bayes rules, and efficiency. Credit is not awarded for STAT 201B if it has already been awarded to STAT 210B if STAT 210B was taken prior to Fall 2013.

STAT 212 Data Science Ethics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 252A or EE 251A or CS 235 or CS 224 or STAT 207 or STAT 208; graduate standing. Covers ethics specifically related to data science. Includes data privacy; data curation and storage; discrimination and bias arising in the machine learning process; statistical topics such as generalization, causality, curse of dimensionality, and sampling bias; data communication; and strategies for conceptualizing, measuring, and mitigating problems in data-driven decision-making. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CS 212. Credit is awarded for one of the following CS 212, STAT 212, CS 108, or STAT 108.

STAT 215 Stochastic Processes 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C, STAT 161; graduate standing. The Markov property; Markov chains; Markov processes and Poisson processes. Birth and death models. Queues. Random walks. Renewal processes. Wiener processes and diffusion.

STAT 217 Mixture Models and Their Applications 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 170, STAT 171, STAT 201C; or equivalent; graduate standing. An introduction of mixture models (also known as latent class models or unsupervised learning models). Includes expectation-maximization (EM) algorithm, mixtures of regression models, and their applications such as clustering and density estimation.

STAT 218 Survival Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 170; graduate standing; or consent of instructor. Introduction to common statistical concepts and methods for analyzing time-to-event data. Topics include survival and hazard functions, censoring and truncation, Kaplan-Meier estimator, log-rank test, Cox proportional hazards model and partial likelihood, variants of Cox model, and alternatives to Cox model. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

STAT 220A Multivariate Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C, or equivalents; graduate standing; familiarity with matrix algebra. Topics include algebra and calculus of vectors and matrices, special multivariate distributions (Normal, Wishart, Hotelling's T-squared, multivariate T, multivariate log-normal, etc).

STAT 220B Multivariate Analysis 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 220A; graduate standing; or consent of instructor. Topics include categorical dependent variable regression, loglinear models, inference in the multivariate normal distribution, multivariate multiple regression, hypothesis testing, likelihood ratio tests, multivariate analysis of variance and covariance, principal components analysis, factor analysis, and classification and discrimination models.

STAT 231A Statistics For Biological Sciences 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 011; or equivalent; restricted to major(s) Biochemistry and Molecular Bio, Biomedical Sciences, Botany, Botany (Plant Genetics), Botany/Plant Sciences, Cell, Molecular, and Developme, Entomology, Environmental Toxicology, Evoltn, Ecol & Organismal Bio, Genetics, Genomics & Bioinform, Microbiology, Neuroscience, Plant Biology, Plant Biology (Plant Genetics), Plant Pathology; graduate standing; or consent of instructor. Covers one- and two-sample tests, one- and two-way analysis of variance, multiple comparison, simple and multiple linear regression, nonparametric statistics, and categorical data.

STAT 231B Statistics For Biological Sciences 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 031; or equivalent; STAT 231A or consent of instructor; graduate standing in Biochemistry and Molecular Biology; Biomedical Sciences; Botany; Cell, Molecular, and Developmental Biology; Entomology; Environmental Toxicology; Genetics, Genomics, & Bioinfomatics; Evolution, Ecology, and Organismal Biology; Microbiology; Nematology; Neuroscience; Plant Biology; Plant Genetics; Plant Pathology; or Plant Science. Covers logistic regression, analysis of covariance, advanced experimental designs, randomization, bootstrapping, jackknifing, and other procedures.

STAT 232 Statistics For Business Analytics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 011; or equivalent; STAT 232 is for Master of Business Analytics (BSBA) program and cannot be used to fulfill credit requirements towards Statistics PhD (STAP); graduate standing; or consent of instructor. Focuses on computing techniques and statistical decision-making approaches. Offers hands-on experience in analyses using R; the interface between relational database and R; data wrangling and visualization; analysis of variance; regression; variable selection; and forecasting. Includes statistical concepts such as correlation versus causality and designed experiments versus observational studies.

STAT 233A Statistics For Public Health 1 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): restricted to major(s) Masters of Public Health Program; graduate standing; or consent of instructor. Defines the role of statistics in public health research and practice. Develops skills to perform exploratory data analysis; learn basic probability and distributions, estimation, and hypothesis testing procedures; and apply them to real-world public health problems. First course in a two-course sequence.

STAT 233B Statistics For Public Health 2 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 233A; restricted to major(s) Masters of Public Health Program; graduate standing; or consent of instructor. Develops skills to perform regression (linear, logistic, and Poisson regression models) and survival data analyses. Additional topics may include power analysis and longitudinal data analysis methods. Applies these methods to real-world public health problems. Second course in a two-course sequence.

STAT 235 Neural Networks and Deep Learning in Business 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 200, STAT 206; restricted to major(s) Business Analytics; graduate standing; or consent of instructor. Delves into modern deep learning methodologies and their transformative applications in business analytics. Covers a wide range of neural network and deep learning topics in business applications. Includes methods introduction, implementations in Python, and a final project on a real-world business problem.

STAT 240 Nonparametric Methods 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C; graduate standing. Theory of distribution-free statistics, ranking statistics, rank correlation, U-statistics. Nonparametric point and interval estimation. Empirical distribution function methods. Combinatorial

problems; runs, matching, occupancy; limiting distributions.

STAT 251 Statistics Colloquium 1 Colloquium, 1.5 hours. Prerequisite(s): graduate standing; and consent of instructor. Presentation of current research in statistics by faculty, advanced graduate students, and guest lecturers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

STAT 255 (E-Z) Seminar On Topics in Applied Statistics 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): see individual segments for prerequisites; graduate standing; or consent of instructor. Provides discussions and lectures by graduate students and faculty on topics related to student and faculty research. The department will maintain a listing of all 255 segments, their unit value, and grading basis.

STAT 255G Seminar On Topics in Applied Statistics 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Covers linear models; theory of least squares; general prediction theory; testing lack of fit; model assessment and selection; mixed models and variance components; collinearity and alternative estimates; generalized linear models; lasso for linear models and generalized linear models; and Bayesian linear models.

STAT 255I Seminar in Order Statistics 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160C and graduate standing. Basic distribution theory of order statistics. Bounds and approximations for moments of order statistics. Inference using order statistics. Record values, concomitants, and outliers. Asymptotic theory. Students may receive either a letter grade or Satisfactory (S) or No Credit (NC) grade. See instructor for grading basis; no petition is necessary.

STAT 255J Seminar On Topics in Applied Statistics 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Topics include linear mixed effects models; generalized linear models; nonlinear mixed effects models; repeated measures; ANOVA/MANOVA; graphical data exploration; correlation structures; parameter estimation/testing inference; and model selection, diagnostics, and limitations. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

STAT 255K Inference For Stochastic Process 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. Maximum likelihood estimation for Markow chains, branching processes, and general stochastic processes; properties of maximum likelihood estimates: likelihood ratio test for Markow chains; and sequential probability ratio tests for some stochastic processes. Students may receive either a letter grade or Satisfactory (S) or No Credit (NC) grade. See instructor for grading basis; no petition is required.

STAT 255M Seminar On Topics in Applied Statistics 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Includes industrial experiments, evolutionary operations, quality assurance, on-line and off-line quality improvement, signal-to-noise ratios, performance criteria, control charts, acceptance sampling, and basic concepts of reliability. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

STAT 255N Seminar in Advanced Statistics 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. Analysis of data, taking account of spatial variations; optimal selection of sample sites; related design considerations; appropriate estimation techniques; variogram and covariance functions estimation using residuals; and practical illustrations. Students may receive either a letter grade or Satisfactory (S) or No Credit (NC) grade. See instructor for grading basis; no petition is required.

STAT 255Q Reliability and Life Testing Models 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C and graduate standing. Structural properties and reliability of coherent systems; cumulative-damage models; fault tree analysis; renewal theory in replacement models; maintenance and replacement models; availability theory; limit distributions for series and parallel systems; censored sampling.

STAT 255R Statistics For Epidemiological Studies 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; STAT 160C, STAT 171, or equivalents or consent of instructor. An introduction to statistical methods for detecting and monitoring disease outbreaks. Focuses on the methods currently in use and the latest developments in literature. Includes univariate and multivariate temporal methods, as well as spatio-temporal methods. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination.

STAT 255S Seminar On Topics in Applied Statistics 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Topics in health statistics essential for statisticians in the health field. Includes life tables, survival analysis, and an introduction to epidemiology and intermediate biostatistics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

STAT 255T Seminar On Topics in Applied Statistics 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Addresses topics related to modern nonparametric statistics. Includes nonparametric density estimation, nonparametric regression, permutation test, bootstrap, and multivariate nonparametric methods. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

STAT 288 Literature Seminar 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Students will make oral presentations summarizing important research papers in the statistics literature. All graduate students are encouraged to participate. Topics may vary each term. Graded Satisfactory (S) or No Credit (NC).

STAT 290 Directed Studies 1 to 6 Prerequisite(s): graduate standing and consent of instructor. Individual studies on specially selected topics in statistical applications. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

STAT 291 Individual Studies in Coordinated Areas 1 to 6 Consultation, 1 to 6 hours. Prerequisite(s): graduate standing. A program of studies designed to assist candidates who are preparing for examinations. Open to M.S. and Ph.D. students; does not count toward the unit requirement for the M.S. degree. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

STAT 292 Concurrent Analytical Studies 1 to 4 Research, 3 to 12 hours, Prerequisite(s): consent of instructor and concurrent enrollment in 100-series course; graduate standing. To be taken on an individual basis. Student will complete a graduate paper related to the 100-series course. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

STAT 293 Methods in Applied Statistics 4 Lecture, 3 hours; discussion, 1 hours, Prerequisite(s): STAT 201C, STAT 202C or equivalent; graduate standing; or consent of instructor. Illustrates problems in interdisciplinary collaborations. Motivates the study and application of advanced statistical methods in applied statistics. Course is repeatable to a maximum of 8 units.

STAT 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing and consent of instructor. Directed research in applications of statistics in biological studies, including computer simulation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

STAT 298I Individual Internship in Statistics 1 to 12 Research, 1 to 12 hours; internship, 2 to 24 hours. Prerequisite(s): restricted to major(s) Statistics; graduate standing; or consent of instructor. An internship to provide statistical field experience in governmental, industrial, or research units. Projects must be approved by the Statistics Department and the head of the unit in which the internship is to be carried out. Requires a written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

STAT 299 Research For Thesis Or Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing and consent of instructor. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Course

STAT 302 College Teaching Practicum 1 to 4 Practicum, 3 to 12 hours. Prerequisite(s): graduate standing and consent of instructor. Required of all teaching assistants in the department. Credit not applicable to graduate unit requirements. Supervised teaching in college level classes under the supervision of the course instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Study of Religion

Subject abbreviation: RLST
College of Humanities, Arts, and Social Sciences

Melissa M. Wilcox, Ph.D., Chair
Department Office, 4033 CHASS Interdisciplinary North
melissa.wilcox@ucr.edu
(951) 827-7969; studyofreligion.ucr.edu

Distinguished Professor

Pashaura Singh, Ph.D. *Dr. Jasbir Singh Saini Endowed Chair in Sikh and Punjabi Studies*

Full Professors

Michael Alexander, Ph.D. *Maimonides Chair in Jewish Studies*
Matthew King, Ph.D.
Amanda Lucia, Ph.D.
Melissa M. Wilcox, Ph.D. *Holstein Family and Community Chair in Religious Studies*

Professors Emeriti

Vivian-Lee Nyitray, Ph.D.
Ivan A. Strenski, Ph.D.

Associate Professors

Elyse Ambrose, Ph.D.
Paul Chang, Ph.D.
Muhamad Ali, Ph.D.
Ana Bajželj, Ph.D., *Shrimad Rajchandra Endowed Chair in Jain Studies*

Assistant Professors

Sahin Acikgoz, Ph.D.

Major

The Department for the Study of Religion provides an opportunity for students to interrogate religion, as a subject always entangled with ethnicity, politics, economics, gender, class, sexuality, and race. With a degree in the study of religion, students examine how religious life is mediated by practice, materiality, language, the senses, embodiment, and culture. The study of religion is interdisciplinary, and students engage in social scientific, cultural, and historical interpretive methods, among others, to study a broad spectrum of the world's religious traditions. Majoring in the study of religion can be an excellent preparation for a variety of careers, such as law, bioethics, human services, business, medicine, education, social work, writing, and the arts.

The study of religion at UCR develops in students a variety of valuable and transferable skills. These include disciplined attention to the facts (texts, ideas, history, behavior), critical reflection and analysis about claims of meaning and value and about assumptions and methods used in the study of religion, and descriptive and analytical writing about religious history, ideas, motivations, practices, and ethical concerns. A minor in Religious Studies is also a productive way to couple interests in such areas as political science, sociology, medicine, psychology, and law with the ethical and cultural contexts in which such fields are enmeshed. Students are encouraged to consult with the department chair and other faculty about their questions and interests.

The Holstein Family and Community Chair in Religious Studies

The Holstein Family and Community Chair in Religious Studies is an endowed faculty chair, the result of a generous contribution given by the Robert and Loretta Holstein family and by friends of the Holstein family and the university. Dr. Melissa M. Wilcox, the holder of this chair, is a distinguished scholar and teacher whose work focuses on queer and transgender studies in religion, and on religion, power, and social justice more broadly. For more information on programs and events sponsored by the Holstein Chair, please see http://religiousstudies.ucr.edu/holstein-chair/

The Dr. Jasbir Singh Saini Endowed Chair in Sikh and Punjabi Studies

The Dr. Jasbir Singh Saini Endowed Chair in Sikh and Punjabi Studies is the result of a generous contribution given by the Saini Foundation, the Sikh Foundation and by a number of individuals and the University. It honors the memory of the late Dr. Jasbir Singh Saini, who was a cardiologist in Phoenix, Arizona. Dr. Pashaura Singh has been appointed to the Chair and is a leading scholar and teacher whose work in the field of Adi Granth studies is internationally acclaimed. For more information on the Endowed Chair, please visit the following website: https://spstudies.ucr.edu/

Maimonides Chair in Jewish Studies

The Maimonides Endowed Chair in Jewish Studies was established in 2014 with support from nearly three dozen individuals, foundations and organizations to fund research and other activities aimed at fostering better understanding of the history and heritage of Jewish people. The chair Dr. Michael Alexander is a leading scholar and teacher whose work addresses religion, ethnicity, genocide, and issues of modern Jewish identity. For more information on the Endowed Chair, please visit the following website: http://jewishstudies.ucr.edu

Shrimad Rajchandra Endowed Chair in Jain Studies

The Shrimad Rajchandra Endowed Chair in Jain Studies was made possible by generous donations from Dr. Jasvant Modi and Dr. Meera Modi, Mr. Mahesh Wadher and Mrs. Usha Wadher, Mr. Vijay Chheda and Mrs. Madhu Chheda, and other members of the Jain community of Southern California. Established in 2017, commemorating the 150th birth anniversary of the Jain spiritual teacher and reformer Shrimad Rajchandra, the Chair's mission is to pursue critical scholarly research of Jainism and advance its study at UCR. Dr. Ana Bajželj was appointed to the Chair in 2018.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

Religious Studies Major

The major requirements for the B.A. degree in Religious Studies are as follows:

1. **Lower-division requirements (12 units)**
   a) RLST 005
   b) RLST 012/ETST 012 or RLST 012W/ETST 012W
   c) One additional 4-unit course in Religious Studies or equivalent
2. **Upper-division requirements (40 units)**
   a) At least four courses from Traditions and Regions and at least two courses from Themes

Traditions and Regions:

RLST 104	Sikhism
RLST 106	Buddhism
RLST 108	Modern Hinduism
RLST 109	New Religious Movements
RLST 111	Islam
RLST 114	Jainism: An Indian Religion of Nonviolence
RLST 123	Global Christianity and Mission
RLST 126/ HIST 127	Israel: The Jewish State
RLST 161/ GSST 158	Gender and Sexuality in U.S. Religious History

Themes:

RLST 101	Religions of India
RLST 116	Religion and Violence
RLST 127/ HISE 147	The Holocaust
RLST 135A/ HIST 130A	History of Christianity: Origins to the Reformation
RLST 135B/ HIST 130B	History of Christianity: Modern Era
RLST 149/ SEAS 149	Southeast Asian Religions
RLST 152	Religion and Oppression
RLST 153	Religion and Social Justice
RLST 159/ GSST 159	Queer Religiosities
RLST 160	Religion, Gender and Sexuality
RLST 180	Saints and Gurus

   b) RLST 100 or RLST 102
   c) RLST 193 (Senior Seminar)
   d) Eight (8) additional units from Religious Studies courses (closely related courses from other programs or departments may be substituted upon approval)

The programs of all majors should be developed in consultation with their advisors.

Art History/Religious Studies Major

The Art History/Religious Studies Major combines the disciplinary interest in the history of the visual arts with its related religious content and background. Three concentrations are

offered. Students must select one family of religions, either Asian or Western, and combine it with the study of the history of the visual arts in the corresponding area of artistic endeavor. Or, students wishing to combine Asian and Western materials to serve a comparative purpose are invited to design their own major in consultation with faculty representatives from both departments. Students are encouraged to include study abroad as part of their major and should plan well in advance to ensure that the courses taken fit with their overall program at UCR. Students in this major will be well prepared for graduate studies in either art history or religious studies.

The major requirements for the B.A. degree in Art History/Religious Studies are as follows:

Asian Concentration (52 units)

1. **Lower-division requirements (12 units)**
   a) Art History (4 units): AHS 015
   b) Asian Studies (4 units): AST 030/CHN 030
   c) Religious Studies (4 units): RLST 005
2. **Upper-division requirements (40 units)**
   a) Art History (16 units): AHS 140, AHS 141, AHS 143, CPLT 141
   b) Religious Studies (24 units) choose from: RLST 101, RLST 103, RLST 105, RLST 106, RLST 142/AST 142/CHN 142, RLST 144/CPLT 144
3. **Optional 190 level work in either Art History or Religious Studies**

Student-designed Comparative Concentration (52 units)

1. **Lower-division requirements (12 units)**
   a) Art History, choose at least 4 units: AHS 015, AHS 017A, AHS 017B, AHS 017C, AST 030/CHN 030
   b) Religious Studies, choose at least 4 units: RLST 005, RLST 007, RLST 010
2. **Upper-division requirements (40 units)**
   a) Art History, choose at least 12 units: AHS 140, AHS 141, AHS 143, AHS 155, AHS 156, AHS 157, AHS 159, AHS 161, AHS 162, AHS 164, AHS 171, AHS 172, CPLT 141
   b) Religious Studies, choose at least 12 units: RLST 100, RLST 101, RLST 103, RLST 105, RLST 106, RLST 111, RLST 121, RLST 128 (E-Z), RLST 130, RLST 131, RLST 135/HISE 130, RLST 136, RLST 142/AST 142/CHN 142, RLST 144/CPLT 144
3. **Optional 190 level work in either Art History or Religious Studies**

Western Concentration (52 units)

1. **Lower-division requirements (16 units)**
   a) Art History (12 units): AHS 017A, AHS 017B, AHS 017C
   b) Religious Studies (4 units) choose from: RLST 007, RLST 010
2. **Upper-division requirements (36 units)**
   a) Art History (16 units) choose from: AHS 155, AHS 156, AHS 157, AHS 159, AHS 161, AHS 162, AHS 164, AHS 171, AHS 172
   b) Religious Studies (20 units) choose from: RLST 100, RLST 111, RLST 121, RLST 128 (E-Z), RLST 130, RLST 131, RLST 135/HISE 130, RLST 136
3. **Optional 190 level work in either Art History or Religious Studies**

Religious Studies/Administrative Studies Major

The major requirements for the B.A. degree in Religious Studies/Administrative Studies are as follows:

Religious Studies requirements (48 units)

1. **Lower-division requirements (12 units)**
   a) RLST 005/RLST 005H
   b) RLST 012/RLST 012H/ETST 012/ETST 012H or RLST 012W/ETST 012W
   c) One additional 4-unit course in RLST
2. **Upper-division requirements (36 units)**
   a) At least four courses from Traditions and Regions and at least two courses from Themes

   Traditions and Regions:
   RLST 104, RLST 106, RLST 108, RLST 109, RLST 111, RLST 114, RLST 123, RLST 126/HIST 127, RLST 161/GSST 158

   Themes:
   RLST 101, RLST 116, RLST 127/HISE 147, RLST 135A/HIST 130A, RLST 135B/HIST 130B, RLST 149/SEAS 149, RLST 152, RLST 153, RLST 159/GSST 159, RLST 160, RLST 180
   b) 1 additional upper-division course in RLST
   c) RLST 100 or RLST 102
   d) RLST 193

Administrative Studies requirements (37 units)

1. **Lower-division requirements (17 units)**
   a) BUS 010, BUS 020
   b) STAT 008 or equivalent (may be used to satisfy breadth requirements
   c) CS 008 (may be used to satisfy breadth requirements)
2. **Upper-division requirements (20 units)**
   a) Two courses (8 units) from the list below:
   (1) ECON 102 or ECON 103 or ECON 104A or ECON 130 or ECON 162/BUS 162
   (2) PSYC 140 or PSYC 142
   (3) SOC 150 or SOC 151
   (4) POSC 181 or POSC 182E or POSC 182G or POSC 183 or POSC 186
   (5) ANTH 127 or ANTH 127S or ANTH 131

   These two courses must be outside the discipline of the relevant major and cannot be courses included as part of the three-course Business Administration track or their cross-listed equivalents.
   b) A three-course track (12 units) in Business Administration courses, from one of the following:
   (1) **Organizations (General)**: BUS 100W, BUS 107, BUS 158/ANTH 105, BUS 176/SOC 176, SOC 150, SOC 151
   (2) **Human Resources Management/Labor Relations**: BUS 100W, BUS 107, BUS 121, BUS 144, BUS 145, BUS 153/ECON 153, BUS 155, BUS 156, BUS 157, PSYC 142
   (3) **Business and Society:** BUS 100W, BUS 102, BUS 107, PHIL 116, POSC 182E or POSC 182G, POSC 186
   (4) **Marketing**: BUS 103, and two from BUS 111, BUS112, BUS 113, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119, BUS 124, BUS 126, BUS 151, BUS 152, BUS 159, BUS 164, BUS 182
   (5) **Managerial Accounting/Taxation**: BUS 108, and two from BUS 166, BUS 168A, BUS 168B
   (6) **Financial Accounting**: BUS 108, BUS 165A, BUS 165B, BUS 165C, BUS 167
   (7) **Finance**: BUS 106/ECON 134 and two from BUS 131, BUS 132, BUS 134, BUS 135, BUS 136, BUS 137, BUS 138, BUS 139, BUS 140E, BUS 141, BUS 147
   (8) **Management Information Systems**: BUS 101, BUS 110, BUS 125, BUS 128, BUS 171, BUS 172, BUS 173, BUS 174, BUS 175, BUS 179
   (9) **Production Management**: BUS 104/STAT 104, and two from BUS 105, BUS 122, BUS 127/STAT 127

   The programs of all majors should be developed in consultation with their advisors.

Minor

Requirements for a minor in Religious Studies are as follows:

1. **Lower-division requirements (12 units)**
   a) RLST 005
   b) RLST 012/ETST 012 or RLST 012W/ETST 012W
   c) One additional 4-unit course in Religious Studies
2. **Upper-division requirements (16 units)**
   a) At least two courses from Traditions and Regions and at least one course from Themes

   Traditions and Regions:

RLST 104	Sikhism
RLST 106	Buddhism
RLST 108	Modern Hinduism
RLST 109	New Religious Movements
RLST 111	Islam
RLST 114	Jainism: An Indian Religion of Nonviolence
RLST 123	Global Christianity and Mission
RLST 126/ HIST 127	Israel: The Jewish State
RLST 161/ GSST 158	Gender and Sexuality in U.S. Religious History

   Themes:

RLST 101	Religions of India
RLST 116	Religion and Violence
RLST 127/ HISE 147	The Holocaust
RLST 135A/ HIST 130A	History of Christianity: Origins to the Reformation
RLST 135B/ HIST 130B	History of Christianity:

	Modern Era
RLST 149/ SEAS 149	Southeast Asian Religions
RLST 152	Religion and Oppression
RLST 153	Religion and Social Justice
RLST 159/ GSST 159	Queer Religiosities
RLST 160/ GSST 160	Religion, Gender and Sexuality
RLST 180	Saints and Gurus

b) Four (4) upper-division units from those courses approved for the Religious Studies major

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Graduate Program

The Department of Religious Studies offers the M.A. and Ph.D. degrees in Religious Studies.

The graduate program in Religious Studies instructs students in the critical academic religious studies. The Ph.D. program focuses on preparing students to enter into academia as researchers and university instructors in a specific field of expertise.

Admission

Although an undergraduate major in religious studies is not required for admission into the graduate program, applicants should demonstrate significant interest and background in the critical academic religious studiess and the appropriate scholarly approaches to religious studies. Applicants to the M.A. and Ph.D. programs must demonstrate scholarly acuity, as well as interest in the critical questions of the discipline of religious studies. Given the broader scope of the M.A. program, applicants to this degree program do not need to specify a particular field of study or concentration they wish to pursue in the program. Applicants to the Ph.D. program, however, should indicate in their applications the current direction of their interests with regard to a specific Ph.D. concentration and field of study.

Master's Degree (M.A.)

The Department of Religious Studies offers two programs of study leading to the M.A. degree (Plan I and Plan II).

Course work

All M.A. students must complete a minimum of 36 units for the degree, including specific course requirements as follows:

1. RLST 201: Thinking about Religion: Classic Theories in the Religious Studies
2. RLST 202: Contemporary Theories and Theorists in the Religious Studies
3. At least 16 additional units at the 200 level in Religious Studies. With approval from the Director of Graduate Studies, 200-level courses in related departments may also fulfill this requirement.
4. Professional development requirement: All M.A. students are required to take three units of the Colloquium in Religious Studies and one unit of additional 400-level coursework in religious studies.
5. The remaining 12 units may be taken as 200-level courses, or as 100-level courses taken in conjunction with RLST 292: Concurrent Studies in Religious Studies. Any RLST course at these levels may fulfill this requirement, and with approval from the Director of Graduate Studies, courses at these levels in related departments may also fulfill this requirement.

Capstone: M.A. Plan I

In addition to the coursework listed above, Plan I M.A. students must prepare a Master's thesis of publication length (typically 25-30 pages) that presents original research and analysis relevant to the field of religious studies under the supervision of a thesis committee.

Capstone: M.A. Plan II

In addition to the coursework listed above, Plan II M.A. students must successfully complete a final master's project under the supervision of a master's committee. Students have some flexibility in the nature of this project, which may take the form of a single, comprehensive written examination designed by the master's committee in consultation with the student, or an applied project suitable for the student's future career goals.

Students planning to complete the Ph.D. must complete the M.A. Plan I.

Language Requirement

Students must demonstrate reading proficiency in a language other than English that is relevant to their interests in religious studies; the department must approve the choice of language prior to completion of the language requirement. If a language is primarily used in spoken form, then spoken proficiency must be demonstrated instead of written proficiency. If there is no clear choice of language for a student's interests (e.g. in the case of a student whose interests lie primarily with theoretical approaches stemming from Anglophone theorists), then the student should select either French or German. This requirement can be fulfilled through a departmental examination of written and/or spoken proficiency, by passing a designated language course (e.g., FREN 009A, FREN 009B, GERM 002R), or by alternative certification (such as a diploma from a foreign language institute).

Normative Time to Degree 6 quarters.

Doctoral Degree (Ph.D.)

Coursework

The following courses are required for all Ph.D. students:

1. RLST 201: Thinking about Religion: Classic Theories in the Study of Religion
2. RLST 202: Contemporary Theories and Theorists in the Study of Religion
3. One of the following core courses, as appropriate for the student's chosen concentration:
   a. RLST 203: Hermeneutics and History
   b. RLST 204: Analytics of Power
   c. RLST 205: Transnational Religions
4. One course in research methods relevant to the student's area of interest. The following courses may fulfill this requirement:
   a. RLST 231: Ethnographic Methodology
   b. RLST 263: Historiography of Sikh Hermeneutics
   c. With the approval of the Director of Graduate Studies, methods courses in related departments at the 200-level (or the 100-level accompanied by 292: Concurrent Enrollment)
5. Professional development requirement Six units of 400-level professional development courses in religious studies, including four units of Religious Studies colloquium and two other units from RLST 400 level courses of their choice.

Concentration

Ph.D. students must select one of the following concentrations, and are expected both to take the associated core course and to focus aspects of their doctoral exams and their dissertation on this theme:

Hermeneutics and History

Analytics of Power

Transnational Religions

M.A. in Religious Studies degree for Ph.D. students

Students entering the Ph.D. program without an M.A. in Religious Studies may apply for the M.A. degree after they have completed the requirements for the M.A. Plan I.

Sixth quarter review:

All Ph.D. students will undergo a review of their performance in the program by the end of their sixth quarter. The review, conducted by the Graduate Program Committee in consultation with the faculty members whose areas of specialization most closely match those of the student, will be based on evaluation of a portfolio of writing compiled by the student in consultation with the faculty member(s) with whom the student has worked the most closely. The committee will make one of three recommendations: Proceed, Hold, or Terminate. Students receiving a recommendation of Hold may reapply once, within three quarters, to proceed in the program; those receiving a recommendation of Terminate who have not previously completed an M.A. in Religious Studies may continue enrolling for no more than three quarters to complete the requirements for the M.A. Plan I or the M.A. Plan II.

Written and oral qualifying examinations

Students must complete a round of qualifying written examinations, followed by an oral defense of those examinations, by the end of their third year and following the completion of all coursework. Students complete the three written examinations over a two- to three

week period.

The topic and the content of each exam is determined by the student in consultation with the examination committee, and must be approved by that committee. After completing the written examinations, students undergo an oral examination by committee. The content of the oral examination is based on the written examination questions and answers.

Both the written and oral examination are composed, administered, and evaluated by a qualifying committee, nominated nine to twelve months before the exam by the student in consultation with the department faculty, and appointed by the graduate dean.

The oral qualifying exam can be taken in one of the following modes: in-person, remote, or hybrid. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. Students taking the exam in-person are expected to be present on campus with all committee members physically present. If hybrid is chosen, the student is expected to be present on campus for the exam in a video enabled room that supports some committee members being physically present and others remote. For a remote exam, all committee members and the student are expected to be in attendance remotely online.

Upon successful completion of the written and oral qualifying examinations, the student is recommended to the graduate dean for advancement to candidacy; at this time, the student also nominates a dissertation committee.

Language requirement
Students must demonstrate reading proficiency in two languages other than English that are relevant to their interests in religious studies; the department must approve the choice of languages prior to completion of the language requirement. If a language is primarily used in spoken form, then spoken proficiency must be demonstrated instead of reading proficiency. If there is no clear choice of language for a student's interests (e.g. in the case of a student whose interests lie primarily with theoretical approaches stemming from Anglophone theorists), then the student should select French and German. This requirement can be fulfilled through a departmental examination of written and/or spoken proficiency, by passing a designated language course (e.g., FREN 009A, FREN 009B, GERM 002R), or by alternative certification (such as a diploma from a foreign language institute).

Dissertation and final defense
Following advancement to candidacy, and working closely with the dissertation committee, doctoral candidates must prepare a dissertation prospectus for approval by that committee. Once all committee members have communicated their approval of the prospectus and all other relevant approvals (e.g., Institutional Review Board) have been obtained, the candidate should begin the process of researching and writing the dissertation, which should be prepared and presented as prescribed by the Graduate Division. When the dissertation is complete and all members of the dissertation committee are satisfied with the written work, the candidate must schedule a dissertation defense. The final defense can be taken in one of the following modes: in-person, remote, or hybrid. The student and their advisor will discuss which mode best suits the subject matter, with the advisor making the final determination. Students taking the exam in-person are expected to be present on campus with all committee members physically present. If hybrid is chosen, the student is expected to be present on campus for the exam in a video enabled room that supports some committee members being physically present and others remote. For a remote exam, all committee members and the student are expected to be in attendance remotely online. This final, public oral examination consists of a 45-minute keynote-style presentation of the dissertation research, followed by questions from the committee and the public audience.

Normative Time to Degree 18 quarters.

Lower-Division Courses

RLST 001 Sex, Sin, and Scripture 4 Lecture, 3 hours; discussion, 1 hour; individual study, .5 hours; term paper, .5 hours. Prerequisite(s): none. An introduction to the academic study of religion. Engages the study of religion thematically, thinking through taboos and injunctions as they are related to specific social and historical contexts. Examines global religious beliefs and practices from diverse cultural perspectives. Credit is awarded for only one of RLST 001 or RLST 001H.

RLST 001H Honors Sex, Sin, and Scripture 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours; individual study, .5 hours; term paper, .5 hours. Prerequisite(s): admission to the University Honors Program or consent of instructor, Honors course corresponding to RLST 001. An introduction to the academic study of religion. Engages the study of religion thematically, thinking through taboos and injunctions as they are related to specific social and historical contexts. Examines global religious beliefs and practices from diverse cultural perspectives. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of RLST 001 or RLST 001H.

RLST 002 Introduction to Comparative Scripture 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the comparisons of Scripture. Includes Sikhism, Zoroastrianism, Judaism, Christianity, Islam, Hinduism, Buddhism, Taoism, and Confucianism. Also addresses a number of the modern New Religious Movements.

RLST 003 Is There A Path of Joy? 3 Seminar, 3 hours. Prerequisite(s): none. Explores therapeutic wisdom traditions that make claims about how to reduce suffering and achieve fulfillment and happiness. Considers worldwide literatures and rituals for their therapeutic claims. Also examines the positive psychology movement, which weds academic research to the task of individual self-help.

RLST 004 Religion, Society, and Culture 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to the study of religion through the lenses of sociology and cultural studies. Explores the mutual influence of religion and social institutions, politics, social movements, and popular culture. Topics may include pluralism, new religious movements and "spirituality", popular culture, social power, and politics. Credit is awarded for one of the following RLST 004 or RLST 004H.

RLST 004H Honors Religion, Society, and Culture 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors; or consent of instructor. Honors course corresponding to RLST 004. Introduction to the study of religion through the lenses of sociology and cultural studies. Explores the mutual influence of religion and social institutions, politics, social movements, and popular culture. Topics may include pluralism, new religious movements and "spirituality", popular culture, social power, and politics. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for one of the following RLST 004H or RLST 004.

RLST 005 Introduction to Asian Religions 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to Asian religions including Hinduism, Buddhism, Sikhism, Confucianism, Taoism, and Shinto. Credit is awarded for one of the following RLST 005 or RLST 005H.

RLST 005H Honors Introduction to Asian Religions 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to University Honors; or consent of instructor. Honors course corresponding to RLST 005. An introduction to Asian religions including Hinduism, Buddhism, Sikhism, Confucianism, Taoism, and Shinto. Credit is awarded for one of the following RLST 005H or RLST 005.

RLST 006 Jesus 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. Examines the figure of Jesus from two main perspectives: historical investigations of Jesus in his first-century context and modern representations of Jesus in the United States.

RLST 007 Jews, Christians, and Muslims 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. Surveys the history, institutions, theologies, and representations of Jews, Christians, and Muslims. Includes distinguishing characteristics, foundational texts, interpretive traditions, rituals, material culture, ethics, political ideologies, and historical interactions of the three religious traditions. Credit is awarded for one of the following RLST 007 or RLST 007H. Credit is awarded for one of the following RLST 007 or RLST 007H.

RLST 007H Honors Jews, Christians, and Muslims 5 Lecture, 3 hours; discussion, 2 hours; extra reading, 3 hours. Prerequisite(s): admission to University Honors. Honors course corresponding to RLST 007. Surveys the history and contemporary religious institutions and representations of Jews, Christians, and Muslims. Includes distinguishing characteristics, foundational texts, interpretive traditions, rituals, material culture, ethics, political ideologies, and historical interactions.

Credit is awarded for one of the following RLST 007H or RLST 007.

RLST 010 Introduction to the Bible 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. A preparation for informed study of the Bible. Examines contemporary interpretive stances, history, methods, and major themes through the study of significant portions of the Bible.

RLST 011 Islam and Feminism 4 Lecture, 3 hours; discussion, 1 hour; written work, 1 hour; term paper, 1 hour. Prerequisite(s): none. Focuses on the intersections between Islam and feminism. Topics include feminist interpretations of the Qur'an, Muslim women's movements and activisms in Islamic and non-Islamic societies, and the complex interactions between the nation-state, religion, gender, and sexuality. Cross-listed with GSST 012, and MEIS 012. Credit is awarded for one of the following RLST 011, GSST 012, MEIS 012, GSST 012H, MEIS 012H, or RLST 011H.

RLST 011H Honors Islam and Feminism 4 Lecture, 3 hours; discussion, 1 hour. Honors course corresponding to RLST 011. Focuses on the intersections between Islam and feminism. Topics include feminist interpretations of the Qur'an, Muslim women's movements and activisms in Islamic and non-Islamic societies, and the complex interactions between the nation-state, religion, gender, and sexuality. Cross-listed with GSST 012H, and MEIS 012H. Credit is awarded for one of the following RLST 011H, GSST 012H, MEIS 012H, GSST 012, MEIS 012, or RLST 011.

RLST 012 Religious Myths and Rituals 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; and images of transcendence. Examines religious beliefs and expressions from diverse cultural perspectives. Utilizes materials from indigenous Native (North and South) American, African American, and/or Asian American religions. Cross-listed with ETST 012. Credit is awarded for only one of ETST 012/RLST 012 or ETST 012H/RLST 012H.

RLST 012H Honors Religious Myths and Rituals 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to ETST 012/RLST 012. An introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; images of transcendence; and understanding religious beliefs and expressions from diverse cultural perspectives. Utilizes source materials from indigenous Native (North and South) American, African American, and/or Asian American religions. Satisfactory (S) or No Credit (NC) grading is not available. Cross-listed with ETST 012H. Credit is awarded for only one of ETST 012/RLST 012 or ETST 012H/RLST 012H.

RLST 013 Religion and Democracy 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. A broad exploration of the complex relationships between religion and democracy. Topics may include the treatment of religion in state constitutions; the role of religion in promoting or repressing democratic governments and movements; state repression of religion; religion in social and civic activism; and religion, peace, and conflict. Credit is awarded for one of the following RLST 013 or RLST 013H.

RLST 013H Religion and Democracy 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors. Honors course corresponding to RLST 013. A broad exploration of the complex relationships between religion and democracy. Topics may include the treatment of religion in state constitutions; the role of religion in promoting or repressing democratic governments and movements; state repression of religion; religion in social and civic activism; and religion, peace, and conflict. Credit is awarded for one of the following RLST 013H or RLST 013.

RLST 014 Religion and Science 5 Lecture, 3 hours; discussion, 1 hour; extra reading, 3 hours. Prerequisite(s): none. Covers major themes in the relation of science and religion. Addresses issues between science and Western religions focusing on Islam and Buddhism. Includes in-depth study of creationism and Darwinian evolution. Explores religious meaning in a scientific cosmos through the study of the contemporary world.

RLST 015 Death 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Investigates the psychological aspects of facing death and dealing with dying persons; cross-cultural religious and philosophical interpretations of death (such as new life, resurrection, and rebirth); and medical, ethical, and legal issues such as physician-assisted suicide and euthanasia. Credit is awarded for one of the following RLST 015 or RLST 015H.

RLST 015H Honors Death 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors or consent of instructor. Honors course corresponding to RLST 015. An examination of three sets of issues pertaining to death and dying: psychological and experiential aspects of facing medical crisis, illness, death, and grief; cross-cultural perspectives on the ways in which death is conceived in selected religions of the world with respect to life and claims about afterlife; public policy issues that involve ethical, legal, and medical concerns regarding euthanasia, physician-assisted suicide, and hospice alternatives. Satisfactory (S) or No Credit (NC) grading is not available. Credit is awarded for only one of RLST 015 or RLST 015H.

RLST 016 Sexuality and Religion in Global Perspective 4 Lecture, 3 hours; discussion, 1 hour. Introduces sexuality studies within the comparative study of religion, rooted in the theoretical frameworks of gender and sexuality studies. Explores the central themes of transnationalism and global dynamics of power. Focuses on critical heterosexuality studies with some LGBT studies and an underlying queer studies perspective. Cross-listed with GSST 016. Credit is awarded for one of the following RLST 016, GSST 016, GSST 016H, or RLST 016H.

RLST 016H Honors Sexuality and Religion in Global Perspective 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): admission to University Honors; or consent of instructor. Honors course corresponding to RLST 016. Introduces sexuality studies within the comparative study of religion, rooted in the theoretical frameworks of gender and sexuality studies. Explores the central themes of transnationalism and global dynamics of power. Focuses on critical heterosexuality studies with some LGBT studies and an underlying queer studies perspective. Cross-listed with GSST 016H. Credit is awarded for one of the following RLST 016H, GSST 016H, GSST 016, or RLST 016.

RLST 019 Black Religion in the United States 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to religion in the experiences of Black people in the United States. Topics include Black religion in the social imagination, in ritual, the arts (e.g., African American spirituals, literature), Black Nationalism, social change, and queernesses in Black religion. Engages primary sources for examining religious contributions in society. Cross-listed with BLKS 019.

RLST 024 Introduction to Native American Culture and Religion 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Interdisciplinary study of contemporary and historic Native American efforts to resist colonialism, with a strong emphasis on land matters, identity issues, and religious forms. Promotes critical reflection on historic and contemporary culture and politics. Cross-listed with HIST 034.

RLST 044 Gods, Ghosts, and Grandparents 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to the rich diversity of Chinese beliefs and practices concerning gods, ghosts, and ancestors through primary and secondary sources. Includes oracle bone inscriptions, philosophical arguments on the existence of spirits, tomb contracts, sutra promoting the goddess Guanyin as Giver of Sons, ghost stories, and eyewitness accounts of funeral rituals. Cross-listed with HIST 044.

RLST 067 Language and Text in Contemporary South Asian Religions 4 Seminar, 3 hours; written work, 6 hours. Prerequisite(s): none. Prepares to undertake independent research of literary sources in contemporary South Asian religious traditions, as well as navigating impacts of Hindi and Urdu linguistic traditions. Focuses on the modern linguistic landscape of Hindustani (hybrid Hindi/Urdu) within the context of religious and culturally revered literary texts. Cross-listed with AST 067.

RLST 068 Language and Text Inner Asian Religions 4 Seminar, 3 hours; written work, 6 hours. Prerequisite(s): none. Focuses on classical linguistic landscape of Tibetan and, in some years, classical Mongolian within the context of religious and culturally revered texts and literary practices. Introduces students to advanced study of major classical language

and literature. Cross-listed with AST 068.

RLST 098 Religion of Modern China 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Examines religions of modern China from Ming to the present. Considers religion and its relationship to politics, society, and culture in the imperial, republican, and communist contexts and the American diaspora. Engages with both heterodox and "mainstream" or "officially sanctioned" traditions while evaluating the factors that merit labels.

Upper-Division Courses

RLST 100 The Problem of Religion 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): one Religious Studies course or upper-division standing or consent of instructor. A survey of critics and defenders of religion who debate meanings and functions of religion in relation to modern challenges such as religious pluralism, secularism, and scientific inquiry. Addresses topics of assigned instructor's expertise

RLST 101 Religions of India 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): one lower-division course in Religious Studies or consent of instructor. An examination of the major religious traditions in India with special emphasis on Hinduism and Buddhism.

RLST 102 Contemporary Themes in Religion and Theory 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of contemporary cultural issues which pose challenges to the nature of religion and the way it is studied in the public university. Issues discussed include race, gender, power, colonialism, and religious commitment.

RLST 103 Decolonizing Religion 4 Lecture, 3 hours; individual study, 3 hours; research, 2 hours; term paper, 1 hour; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Introduces the constitution of the Western category of religion as it was (and is) fortified through colonial encounter. Engages deeply with colonial archives and underscores the collaboration between religion and colonial domination. Topics also include decolonizing methodologies in Religious Studies including liberation theology and critical theory.

RLST 104 Sikhism 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the social and religious evolution of Sikhism over the past five centuries, tracing its formation in North India to traditions beyond the Indian subcontinent; examines the teachings of Guru Nanak and major doctrinal developments under subsequent Gurus.

RLST 105 Gender, Sexuality, and Islam 4 Lecture, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. Focuses on the intersections between gender, sexuality, and religion in Islamicate societies. Discusses the ways in which those formations have been shaped by histories of slavery, imperialism, colonialism, human rights discourses, neoliberalism, contemporary practices of Islamophobia, nationalism, and global LGBTQ activism. Cross-listed with GSST 110, and MEIS 110.

RLST 106 Buddhism 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Aspects of the history and development of Buddhism in its major forms (Theraveda, Mahayana, and Vajrayana). Studies of principal sutras, biographies, ethical treatises, birth narratives, and poetry.

RLST 107 Judaism 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Introduces Judaism as a religious tradition. Topics include Torah, rabbinic literature, theology, philosophy, mysticism, messianism and nationalism, ritual and worship, the synagogue, life cycle events, and festivals. Emphasizes global manifestations.

RLST 108 Modern Hinduism 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of developments in the Hindu religious tradition during the nineteenth and twentieth centuries, inside and outside of India. Topics covered include the impact of colonialism and nationalism on Hinduism, the rise of neo-Hindu movements, modern Hindu "fundamentalism," and Hinduism in the modern Western world.

RLST 109 New Religious Movements 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Analyzes the contexts in which new religions emerge, their relations with dominant religious traditions or normative cultures, and the religious content of such movements. Examines the "cult" versus "religion" debate; apocalyptic, eschatological, and millennial views of the world; the nature of charismatic leadership; regional patterns; and transnational trends.

RLST 110 Yoga: Ancient and Modern 4 Lecture, 3 hours; individual study, 1 hour; research, 1 hour; term paper, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Investigates yoga in its transition from an ancient Indic system of contemplative practice to its modern postural forms. Engages the history of yoga in India and its primary texts and current cultural and religious debates activated through the globalization of modern postural yoga.

RLST 111 Islam 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of Islam from the time of Muhammad (d. 632 A.D.) to the present. Attention is given to its distinctive beliefs and practices, its influence upon societies in which it became dominant, and its interaction with other traditions.

RLST 112 Islam in America 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores historical and contemporary dimensions of Islam in America and the way in which Islam shapes and is shaped by American politics and cultures. Introduces analytical tools for understanding Islam and contemporary ideas and practices including conversion, migration and diaspora, ritual, politics, ethics, education, gender, and media.

RLST 113 Topics in Modern Islam 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines key issues facing Islam in the modern world such as Islam's engagement with and reaction to nationalism, feminism, the status of sacred texts in the face of critical historical and philological studies, science, and technology.

RLST 114 Jainism: An Indian Religion of Non-Violence 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): Restricted to class level standing of junior, or senior; or consent of instructor. Introduces the Indian religion of Jainism. Explores various aspects of Jainism including history, sectarian divisions, texts, doctrines, practices, and its relationship with other Indian traditions.

RLST 115 Black Religion, Resistance, and Moral Imagination 4 Lecture, 4 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A survey of various figures and communities that have resisted hegemonic norms in Black religion in the United States. Explores historical primary resources, literature, oral histories, and contemporary artistic and cultural productions. Examines moral visions of Black and collective resistance and thriving. Cross-listed with BLKS 115.

RLST 116 Religion and Violence 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the capacity of religion to mobilize and legitimate violence. Materials covered include theoretical texts by Rene Girard, Walter Burkert, Jonathan Z. Smith, and others, and case studies dealing with religion and violence in India, Northern Ireland, Egypt, Lebanon, Israel, Palestine, Sri Lanka, and the United States.

RLST 117 Mythology 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative study of mythic traditions from several world cultures and religions viewed from a variety of theoretical perspectives. Includes material drawn from epics, religious texts, divine hymns, creation myths, heroic legends, and concepts of the afterlife as reflected in literary and nonliterary sources. Cross-listed with CLA 112, and CPLT 112.

RLST 118 The Problem of Evil: Understanding Evil and its Manifestations 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the ways that Western culture and religion have defined evil. Primarily investigates religious discourses, but also considers philosophical, social scientific, and popular ideas of evil. Examines evil from the perspectives of the victim, the perpetrator,

and the voyeur, and in a variety of media such as fiction, nonfiction, and film.

RLST 119 Meditation as Medicine: A Critical Exploration 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A critical exploration of the transformation of Buddhist meditation traditions over the last twenty-five centuries. Addresses the foundational techniques and debates in India; mass meditation as colonial resistance in Burma; recent interest in the brain sciences; and the commodification of mindfulness, compassion, and selflessness in the neoliberal marketplace. Cross-listed with AST 117, and MHHS 119.

RLST 120 Tibetan Buddhism: Dalai Lamas, Tantric Madness, and Mass Monasticism 4 Lecture, 3 hours; term paper, 1 hour; written work, 1 hour; research, 1 hour. Prerequisite(s): Restricted to class level standing of junior, or senior; or consent of instructor. Introduces the globally influential Tibetan Buddhist tradition of the Dalai Lamas, Covers the development of its unique history, doctrine, literary heritage, and gendered ritual cosmologies. Cross-listed with AST 120

RLST 121 The Hebrew Bible/Old Testament 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the collection of books usually called the Old Testament by Christians and the Bible by Jews (the acronym T'N'CH is often used by Jews as well). The books are examined in their historical, cultural, and religious contexts, with attention to the methods of modern literary criticism.

RLST 122 Medicine and Asian Religions in Global Circulation 4 Lecture, 3 hours; individualized study, 6 hours; research, 1 hour; term paper, 2 hours. Prerequisite(s): Restricted to class level standing of Sophomore, Junior, or Senior. Considers the relationship between religious cosmologies, the organization of knowledge, and the practices for managing bodily and natural order that underpin three major medical traditions of Asia in premodern and modern periods: Ayurveda, Traditional Chinese Medicine, and Tibet's Four Tantra Tradition.

RLST 123 Global Christianity and Mission 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): Restricted to class level standing of junior, or senior; or consent of instructor. Explores how Christianity was indigenized in the cultures of Africa, Asia, and Latin America, where it is growing most rapidly today. Examines the role of the mission including historic dominance of Western Europe and North America. Considers the interactions of Christianity with gender, economics, vernacular language, local and international politics.

RLST 125 Studies in Religion 4 Lecture, 3 hours; extra reading, 2 hours; written work, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. Provides an in-depth consideration of specific topics in the study of religion. Course is repeatable as content or topic changes to a maximum of 16 units.

RLST 126 Israel: the Jewish State 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines Zionism and the state of Israel in the period from the first Zionist Congress in 1896 to the present. Addresses religious, social, economic, and political aspects of the Jewish state. Cross-listed with HIST 127.

RLST 127 The Holocaust 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the extermination of European Jewry during World War II. Surveys the history of the "Jewish Question"; Jewish-Christian relations; race; the systematic persecution and genocide of the Jews; and world responses to genocide. Addresses religious, philosophical, and political implications of the Holocaust, as well as continuing anti-Semitic trends. Cross-listed with HISE 147.

RLST 129 History of Philosophy in India 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. An examination of the main philosophical themes, figures, and texts in premodern India. Pays particular attention to Hindu, Buddhist, and Jain philosophy. Cross-listed with AST 130, and PHIL 129.

RLST 130 The Bible: New Testament 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the literature and history of the early Christian movement. Attention is given to New Testament materials and apocryphal writings.

RLST 131 The Buddha's Brain: Mind, Reality, and Power in the Buddhism-Science Dialogue 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A critical history of the "Buddhism-Science dialogue." Focuses on contested characterizations of mind, brain, and personhood. Includes reading and analyzing primary sources in the Indo-Tibetan Buddhist tradition alongside the brain sciences. Prepares for advanced courses and research in religious studies, the medical humanities, and Asian studies. Cross-listed with AST 131, and MHHS 131.

RLST 133 Christian Origins 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the social, religious, and cultural development of Christianity in its first six centuries. Particular attention paid to issues of heresy/orthodoxy, material piety, and the rise of ecclesiastical institutions.

RLST 135A History of Christianity: Origins to the Reformation 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Surveys the history of Christianity from its origins through the Reformation. Includes the development of Christian beliefs, practices, and institutions in historical contexts. Cross-listed with HIST 130A.

RLST 135B History of Christianity: Modern Era 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Surveys the history of Christianity since 1500. Emphasizes the Christianization of Asia, Africa, and the Americas in the long colonial era. Follows developments in Christian belief, practice, and institutions up to the present. Topics include Reformation, mission, colonialism, empire, conversion, syncretism, modernity, Vatican II, and the rise of evangelical Christianity. Cross-listed with HIST 130B.

RLST 137A Religious Cultures in Early America 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; HIST 017A is recommended. An introduction to religious beliefs and practices during the seventeenth and eighteenth centuries in the colonies that became the United States. Cross-listed with HISA 122A.

RLST 137B Religious Cultures in Modern America 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; HIST 017B is recommended. An introduction to a variety of religious traditions, movements, and cultures from 1800 to the present in the United States. Cross-listed with HISA 122B.

RLST 140 Language and Text in Classical South Asian Religions 4 Seminar, 3 hours; written work, 6 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Prepares to undertake independent research of literary sources in South Asian religious traditions. Focuses on the linguistic landscape of Sanskrit within the context of religious and culturally revered literary texts. Topics include literature, translation theories, and introductory grammatical and syntactic analysis.

RLST 142 Zhuangzi 4 Lecture, 3 hours; research, 1 hour; extra reading, 1 hour; term paper, 1 hour. Prerequisite(s): CHN 107 or CHN 112 or PHIL 110. An examination of chaos, epistemological and linguistic relativism, fate, skill, and the character of the sage in the Chinese Daoist text Zhuangzi. Discusses the structure and style of this literary masterpiece. Students with knowledge of classical Chinese may arrange additional work through special studies. Cross-listed with AST 142, and CHN 142.

RLST 143 Divination and Prediction in China and Greece 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): AST 030 or CHN 030 or CPLT 030 or CHN 104 or CHN 105 or CHN 107 or CHN 108 or AST 142 or CHN 142 or RLST 142 or AST 148 or CHN 148 or CLA 010A or CLA 010B or CLA 010C or CLA 040 or CLA 050 or CLA 100 or CLA 112 or HISE 110 or CPLT 112 or RLST 117 or CLA 114 or CPLT 114 or CLA 120 or CPAC 102 or CLA 102 or CPAC 112 or CLA 113 or HISE 113 or CPAC 121 or CLA 121 or POSC 121 or CPAC 132 or AST 132 or CHN 132 or CLA 132 or CPAC 133 or HISE 114 or CPAC 134 or HIST 110 or CPAC 141 or AST 145 or CHN 141 or CLA 141

or POSC 140; restricted to class level standing of junior, or senior; or consent of instructor. Comparative study of early divination and prediction in early China, ancient Greece, or two other areas of the ancient world. Perspectives include social and intellectual contexts and institutions, as well as gender and boundaries between science, philosophy, and religion. Utilizes primary source material in texts and visual arts. Cross-listed with CHN 143, CLA 143, and CPAC 143.

RLST 144 Buddhist Literature 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Explores readings in canonical and non-canonical Buddhist texts. Includes Buddhist-influenced literature written by Asian, European, and American authors. Examines themes of emptiness, impermanence, and no-self. Cross-listed with AST 133.

RLST 146 Rhetoric and Discipline in Buddhist Studies 4 Lecture, 3 hours; written work, 2 hours; activity, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of key works in Buddhist studies in an effort to flesh out a critical history of academic portrayals of Buddhism. Explores the history and boundaries of the field and its relationship to modes of Buddhist and non-Buddhist rhetoric and interpretation in colonial, Orientalist, socialist, and neo-liberal contexts.

RLST 148 Religions of the Silk Road 4 Lecture, 3 hours; individual study, 3 hours; written work, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to religious traditions that flourished along the ancient Silk Road. Includes Zoroastrianism, Buddhism, Manichaeism, Nestorian Christianity, Islam, and Judaism. Focuses on the spread, development, and interaction through the medieval period. Considers ways in which the Silk Road period legacy figures in religious and political debates in contemporary Central Asia.

RLST 149 Southeast Asian Religions 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one Religious Studies course or upper-division standing or consent of instructor. Introduces aspects of religion in various Southeast Asian countries including Indonesia, Malaysia, Thailand, Cambodia, Vietnam, and the Philippines. Provides contextualized readings featuring historical, anthropological, literary, and other disciplinary perspectives. Cross-listed with SEAS 149.

RLST 150 Islam in Southeast Asia 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the religious, intellectual, and cultural history of Muslim Southeast Asia. Includes Indonesia, Malaysia, and Brunei, as well as minority communities in Singapore, Thailand, Cambodia, and the southern Philippines. Examines a series of contextualized readings in translated primary sources. Approaches texts from historical, anthropological, literary, and other disciplinary perspectives. Cross-listed with SEAS 150.

RLST 151 Reading the Qur'an 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the Qur'an, Islam's primary scripture. Examines the contexts in which the text originated. Offers critical analyses of the Qur'an and discussion of its roles in the cultural histories of Muslim societies.

RLST 152 Religion and Opression 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S or RLST 001 or RLST 001H or RLST 002 or RLST 003 or RLST 005 or RLST 005H or RLST 007 or RLST 007H or RLST 010 or RLST 012 or ETST 012 or RLST 012H or ETST 012H or RLST 014 or RLST 015 or RLST 015H or RLST 024 or HIST 034 or RLST 044 or HIST 044; may be taken in sequence with RLST 153; or consent of instructor. Analyzes the relationship between religion and oppression, including religion as target of oppression, religion as cause of oppression, and religion as mitigating or exacerbating force in oppression. Religious studies, feminist, critical race, queer, and post/anti-colonial theoretical perspectives undergrid the analysis.

RLST 153 Religion and Social Justice 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S or RLST 001 or RLST 001H or RLST 002 or RLST 003 or RLST 005 or RLST 005H or RLST 007 or RLST 007H or RLST 010 or RLST 012 or ETST 012 or RLST 012H or ETST 012H or RLST 014 or RLST 015 or RLST 015H or RLST 024 or HIST 034 or RLST 044 or HIST 044; may be taken in sequence with RLST 152. Analyzes the roles of religion in revolution, resistance, protest, and social justice movements, including religion as motivation for revolution, religion as target of revolution, and revolution within religions. Religious studies, feminist, critical race, queer, and post/anti-colonial theoretical perspectives undergrid the analysis.

RLST 155 Peace in the Middle East 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the roots of the Middle Eastern crises. Focuses on the Arab-Israeli conflict and possible solutions toward peace. Addresses problems through historical, religious, and political lines of inquiry. Cross-listed with PHIL155.

RLST 156 Jews and Arabs 4 Lecture, 3 hours; extra reading, 3 hours Prerequisite(s): upper-division standing or consent of instructor. Traces the formation of the shared and divided history of the Jewish and Arab peoples. Focuses on the literary and institutional dimensions of this history, as well as the formation of related areas of study, such as religion, philosophy, literature, and psychoanalysis. Cross-listed with ARLC 156, CPLT 156, and MEIS 156.

RLST 159 Queer Religiosities 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S or RLST 001 or RLST 001H or RLST 002 or RLST 003 or RLST 005 or RLST 005H or RLST 007 or RLST 007H or RLST 010 or RLST 012 or ETST 012 or RLST 012H or ETST 012H or RLST 014 or RLST 015 or RLST 015H or RLST 024 or HIST 034 or RLST 044 or HIST 044. A comparative, thematic exploration of religion in the lives of contemporary same sex attracted and gender variant or gender nonconforming people around the world. Topics may include intersections of religion with: neoliberal economic and political strategies; globalization; global North/South inequities; settler colonialism; racial, economic, and gender inequalities; homonormativity/homonationalism; queer activism. Cross-listed with GSST 159.

RLST 160 Religion, Gender and Sexuality 4 Lecture, 3 hours; consultation, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examination of attitudes toward and images of women in diverse religious traditions. Includes issues such as the presence and absence of women in leadership roles; women's spiritual experiences; female founders of religious groups; and recent developments in feminist religious thought. Cross-listed with GSST 160.

RLST 161 Gender and Sexuality in U.s Religious History 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): GSST 001 or GSST 001H or GSST 001S or RLST 001 or RLST 001H or RLST 002 or RLST 003 or RLST 005 or RLST 005H or RLST 007 or RLST 007H or RLST 010 or RLST 012 or ETST 012 or RLST 012H or ETST 012H or RLST 014 or RLST 015 or RLST 015H or RLST 024 or HIST 034 or RLST 044 or HIST 044; or consent of instructor. Overview and analysis of gender and sexuality in religion from colonial period (including Spanish, French, Russian, and British colonies in what is now the United States) to present day. Combines critical and comparative religious studies approaches with historical methods and the analytical perspectives of intersectional gender, sexuality, and queer studies. Cross-listed with GSST 158.

RLST 162 Women's Issues in Modern Muslim Thought 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): one Religious Studies course or upper-division standing or consent of instructor. Introduces complex religious and social issues related to the role of women in modern Islamic societies ranging from North America to Southeast Asia. Examines Muslim writings produced during the past century. Cross-listed with GSST 162.

RLST 166 Evangelical Religion, Media, and Culture in America 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the history of the use of media technologies among evangelicals. Addresses the interconnections between religious productions of meaning, proselytization, and politics. Explores the ways the critical interlace of religion and media both shapes and is shaped by the ways participants understand themselves as racial, gendered and classed subjects.

RLST 169 Religion and Music 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the complex intersection of sound, religion, religious experience,

and culture. Explores how sacred music and varieties of sound-induced or sound-enhanced religious experience enables groups of people to construct religious meaning and understand their world. Focuses on musical forms of practices and embodied experiences of the sacred.

RLST 173 Political Religions and Religious Politics 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Investigation of major themes and issues in the intersection of religion and politics, such as the sacralization of politics, religious nationalisms, sacral kingship, revolutionary asceticism, "throne and altar," civil religion, millennialism, political myth and ritual, integralism, and the conformity of the polity to religious values. Cross-listed with POSC 109.

RLST 176 Peace and War 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of peace and war from diverse religious and ethical perspectives. Addresses nuclear and conventional war and revolutionary wars of liberation as ethical issues requiring social policy and personal decision. Topics include "just war," "holy war," nonviolence, and pacifism.

RLST 177 History of the Church in Latin America 4 Lecture, 3 hours; term paper, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the history of the church (e.g. Catholic, Protestant) in Latin America. Includes conquest and mission, indigenous responses to Christian conversion, the long colonial period, independence, revolution, and liberation theology movements. Explores the dynamics of church and culture, church and state, and church and social transformation. Cross-listed with HISA 168.

RLST 179 Pilgrimage 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A study of pilgrimage and religious tourism in selected traditions. Includes historical, sociological, anthropological, and ritual analysis of the construction of sacred time and space and of the formation of communal and personal identity.

RLST 180 Saints and Gurus 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores how religious virtuosi have shaped religious practice and the teaching of Hinduism, Buddhism, Jainism, Sikhism, and Islam in South Asia. Examines history, myth, poetry, meditation, yoga, and ritual, with a focus on how the ascetic ideal has shaped global imagination about South Asia.

RLST 190 Special Studies 1 to 5 Individual Study, 3 to 15 hours. Prerequisite(s): consent of instructor and department chair. To be taken to meet special curricular problems. Course is repeatable to a maximum of 16 units.

RLST 193 Senior Seminar 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Advanced undergraduate study of specific religious texts, traditions, or key underlying themes as set by the instructor. Topics vary each year.

RLST 195 Senior Thesis 1 to 4 Enrollment by request of student with the approval of the Program faculty, which must be granted no later than the quarter before the course is to be taken. May be taken for four units only in the first or second quarter of the senior year; two more units may be taken in a subsequent quarter. Total credit may not exceed 6 units.

RLST 197 Research For Undergraduates 1 to 2 Individual research, 3 to 6 hours. Prerequisite(s): upper-division standing or consent of instructor. Directed individual research. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable to a maximum of 4 units.

RLST 198I Individual Internship 1 to 6 Internship, 2 to 12 hours; reading and writing, 1-6 hours. Prerequisite(s): upper-division standing or consent of instructor; consent of department chair. An individually designed, academically grounded internship that provides an opportunity for advanced majors to apply their knowledge of religion to businesses and organizations outside the university. Prior approval of the instructor and supervisor is required for units, fieldwork, and academic content. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 6 units.

Graduate Courses

RLST 200A Religion, Politics, and Public Discourse 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor; consent of graduate advisor is required for students repeating the course. Critical examination of the intersections of religious identities and public politics. Topics vary by instructor but may include human rights, "church-state" debates, Islamism, civil religion, and postcolonial religions. Completion of the RLST 200A, RLST 200B, RLST 200C sequence fulfills the Graduate Professional Development Requirement. Course is repeatable to a maximum of 8 units if taken with different instructors.

RLST 200B Representations, Interpretations, and Critical Histories 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; consent of graduate advisor is required for students repeating the course. Examines how religious identity and studies have shaped and been shaped by modes of representation, interpretation, and historical awareness. Topics vary but may include biographies, art and architecture, mass media, and scriptural interpretation. Completion of the RLST 200A, RLST 200B, RLST 200C sequence fulfills the Graduate Professional Development Requirement. Course is repeatable to a maximum of 8 units if taken with different instructors.

RLST 200C Religions in Contact 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor; consent of graduate advisor is required for students repeating the course. Examines how religions confront each other historically, politically, and metaphorically. Specific topics vary according to instructor but may include syncretism, mission and colonization, religious wars, ecumenism, and "world religion" movements. Completion of the RLST 200A, RLST 200B, RLST 200C sequence fulfills the Graduate Professional Development Requirement. Course is repeatable to a maximum of 8 units if taken with different instructors.

RLST 201 Thinking About Religion: Classic Theories in the Study of Religion 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. A critical study of classic theories and theorists in the study of religion within their historical contexts. Featured thinkers include Frazer, Eliade, Smart, Spinoza, Durkheim, Freud, and Weber. Considers such intellectual movements as Higher Criticism of the Bible, psychoanalysis, phenomenology, and hermeneutics. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 202 Contemporary Theories and Theorists in the Study of Religion 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor; consent of graduate advisor is required for students repeating the course. A critical consideration of leading contemporary theories and theorists in religious studies. Selection of theories and theorists changes according to the interests of the instructor. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 16 units if taken with different instructors.

RLST 203 Hermeneutics and History 4 Seminar, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Advanced topics in the critical study of religion, history, social theory, and hermeneutics. This course serves as the core course for the Hermeneutics and History Ph.D. track in Religious Studies.

RLST 204 Analytics of Power 4 Seminar, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Advanced topics in the study of religion, power, and resistance. This course serves as the core course for the Analytics of Power Ph.D. track in Religious Studies.

RLST 205 Transnational Religions 4 Seminar, 3 hours; term paper, 1 hour; extra reading, 2 hours. Prerequisite(s): graduate standing; or consent of instructor. Advanced topics in the study of religion and transnationalism. Serves as the core course for the Transnational Religions PhD track in Religious Studies.

RLST 206 Queering Islam 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Explores whether queer and trans can function as useful and productive categories in Islamicate contexts despite their dominant Eurocentric and secular underpinnings. Also investigates what it would mean to integrate these categories through an Islamicate lens.

RLST 207 Queering Religion in the African Diaspora 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Surveys contemporary contributions to the disciplinary lines of queer African diaspora religious studies in the Americas and the Caribbean. Explores how queerness and queering functions in the study of spiritual and religious spaces. Includes study of embodiment, divinities, rituals, and spiritual and religious practices.

RLST 208 Otherwise Methods: Experiment in the Study of Religion 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing; or consent of instructor. Explores innovative and otherwise approaches to method in the study of religion. Examines themes of embodiment, divinities, rituals, cultural traditions, gender and sexuality, qualitative and quantitative approaches, and spiritual and religious practices. Invites interrogation and creative development (with collective insight) the methods that best serve research endeavors.

RLST 220 Advanced Topics in Method and Theory in the Study of Religion 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An inquiry into the major conceptual issues of the methods and theories employed in the study of religion. Topic varies from quarter to quarter. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 221 The Religious Studies-Theology Debate 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Addresses current debates concerning the relation of theologies to humanistic studies of religion. Covers neoorthodox, liberal, post-liberal and postmodern theologies as alternatives to varieties of the humanistic study of religion in the public university. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 224 Comparative Religious Ethics 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Inquiry into a variety of debates about ethics: religious and philosophical, theoretical and applied. Topics may include policy debates about bioethics, moral inquiries into virtue, ethics and minority discourse, violence and nonviolence as means of social change, or fundamental moral problems generated by suffering. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 230 Theory and Writing On Native American Religious Traditions 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Theoretical study of Native American religious history, including its research, interpretation, and writing, in relation to colonialism and tribal sovereignty. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 231 Ethnographic Methodology 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Assists in the design and implementation of sustained field research while engaging various theoretical approaches to ethnographic practice. Provides preparation for or in service of dissertation research. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 237 Asceticism 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Provides an analysis of the theories and practices associated with bodily renunciation, focused especially on the first Christian centuries. Explores issues such as fasting, sexual abstinence, and social withdrawal from a variety of critical perspectives, with special attention paid to gender, status, and the body in religion. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 240 Advanced Topics in the Study of North American Religion 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Explores major issues in recent scholarship in North American religion. Topics include debates over emerging theories such as narrative and market model approaches; secularism; immigration, race, and ethnicity; religion and national identity formation; religious imagination in regards to border and boundary crossing; and the role of Protestant privilege. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 241 From Text to Scripture: Canon, Performance, Reception 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Focusing on the Sikh sacred text as a primary example, investigates the intellectual and emotional factors underlying the composition, copying, canonization, and transmission of sacred texts, with attention to issues of production and reception in historical communities. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 245 Via Mystica 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines religious virtuosi in Islam, Christianity, Hinduism and Buddhism, including Puu Mi Bun, sufis, swamis, saints, and martyrs. Uncovers the close connection between these religions in terms of ritual technology, soteriological goals, meditative practices, and eschatological articulations. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 249 Public Religious Discourses in Modern Islam 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces the complexities of contemporary Islam as lived by Muslims in local and global contexts by examining the content and dynamics of modern discussions of religious and social issues in Muslim "public spheres." Involves primary and secondary sources of information. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 252 Southeast Asian Islam 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to contextualized readings in translated primary source texts in the fourteenth through the twenty-first centuries from Muslim Southeast Asia. Explores the richness of Islamicate culture in the region through discussions of broader issues of Islam, Muslim societies, and the academic study of religion. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 253 Southeast Asian Religions 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Discusses different and dynamic aspects of religion in various Southeast Asian countries including Indonesia, Malaysia, Thailand, Cambodia, Vietnam, and the Philippines. Explores contextualized readings featuring historical, anthropological, literary, and other disciplinary perspectives on this diverse region. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable as topic changes to a maximum of 8 units. Cross-listed with ANTH 257 and SEAS 202.

RLST 254 Queer and Transgender Studies in Religion 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Advanced study of classic and current works in the subfields of queer and transgender studies in religion. Specific topics may include: queer analysis of sacred texts and religious histories, gender variance in religious traditions, queer/trans religious innovation, and queer feminist, critical race, and anti- and postcolonial studies perspectives on religion. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 257 The Sufis 4 Seminar, 3 hours; term paper, 2 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to sufism through an in-depth reading of the great Sufi poets. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Cross-listed with CWPA 257.

RLST 261 Problems in the Study of Buddhism 4 Seminar, 3 hours. research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines controversies in the field of Buddhist studies. Topics include the rise of asceticism in India, the composition

of the earliest Buddhist texts, the process of transmission of texts and translation problems, the rise of sectarian debate, and women's role in Buddhist ecclesia. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 263 Historiography of Sikh Hermeneutics 4 Seminar, 3 hours. research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines the historiography of Sikh hermeneutics, focusing on the historical contexts of various schools of interpretations of the Adi Granth in premodern, modern, and postmodern periods. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 270 Topics in Jewish Studies 4 Seminar, 3 hours. research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Examines current problems in the field of Jewish studies. Topics address issues related to memory, identity, economy, power, gender, race, genetics, and culture. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 272 Jews and the Economy 4 Seminar, 3 hours. research, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Surveys facts and fictions about Jews and the economy. Topics include usury, the court Jew, finance, retail and manufacturing, labor movements, organized crime, and culture industries. Addresses select issues of culture and economy, as well as depictions of Jewish money in literature, film, and journalism. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

RLST 290 Directed Studies 1 to 5 Research, 3 to 15 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Advanced work in a topic or topics appropriate to the student's special interests and needs. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

RLST 291 Individual Study in Coordinated Areas 1 to 12 Individual Study, 3 to 36 hours. Prerequisite(s): consent of instructor; doctoral standing. Program of study designed to advise and assist candidates who are preparing for qualifying examinations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

RLST 292 Concurrent Studies in Religious Studies 1 to 4 Research, 3 to 12 hours. Prerequisite(s): concurrent enrollment in a RLST-100 level course; graduate standing; consent of instructor. Taken concurrently with a 100-level RLST course, but on an individual basis. Devoted to completion of a graduate paper based on research related to the 100-level course. Faculty guidance and evaluation is provided throughout the quarter. RLST 190, RLST 193, RLST 195, RLST 197, and RLST 198-I may not be used for this course arrangement. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

RLST 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): consent of instructor; graduate standing Individualized research under the sponsorship of specific faculty members. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

RLST 299 Research For the Dissertation 1 to 12 Research, 3 to 36 hours. Prerequisite(s): graduate standing; satisfactory completion of the Ph.D. qualifying examination. Research, under the direction of a faculty member, for preparation of the thesis or dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

RLST 302 Teaching Practicum 1 to 4 Practicum, 3 to 12 hours. Prerequisite(s): appointment as a Teaching Assistant; graduate standing. Supervised teaching in lower- and upper-division Religious Studies courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

RLST 401 Colloquium in Religious Studies 1 Colloquium, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Religious Studies research colloquium participation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content or topic changes to a maximum of 6 units.

RLST 402 Pedagogy 1 Seminar, 1 hour; written work, 0.5 hour; extra reading, 0.5 hour. Prerequisite(s): graduate standing; or consent of instructor. Pedagogical considerations in the teaching of religious studies. Graded Satisfactory (S) or No Credit (NC).

RLST 403 Surviving the Job Market 1 Seminar, 1 hour; written work, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Preparation for the traditional academic job market in religious studies. Graded Satisfactory (S) or No Credit (NC).

RLST 404 Research, Writing, and Publication 1 Seminar, 1 hour; written work, 1 hour. Prerequisite(s): graduate standing; and consent of instructor. Professional skill development in research preparation, funding, and publication. Graded Satisfactory (S) or No Credit (NC).

RLST 405 Careers in Applied Religious Studies 1 Seminar, 1 hour. Prerequisite(s): graduate standing; or consent of instructor. Introduction to and preparation for career options beyond the professorial track. Graded Satisfactory (S) or No Credit (NC).

Related Courses

ANTH 124 Ritual and Religion 4 Lecture, 3 hours. The elements and forms of religious belief and behavior; functions of ritual in society. Cross-cultural comparisons.

AHS 155 Cultures in Conflict: Art at the Fall of the Roman Empire 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Covers architecture, mosaic, wall painting, manuscript illumination, and sculpture from the origins of Christianity to the final dissolution of the Roman Empire. Stresses the role of art in the co-optation of the Church by the Empire and then in the aftermath of its fall.

AHS 156 Memory of Empire: the Art of Early Medieval Europe 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Covers manuscript illumination, barbarian jewelry, architecture, and sculpture from the fall of the Roman Empire and through the Carolingian Empire up to the tenth century. Stresses the interplay between indigenous Germanic and foreign classical traditions.

ENGL 100 (E-Z) Scriptures, Myths, and Interpretation 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Focuses on issues of scriptural and mythical analysis. Explores the impact of scripture and myth on literature written in English; textual development of the Hebrew scripture including the development of the King James version; major authors' uses of scripture and myth; exegesis; scripture and myth in current criticism and theory.

Theatre, Film, and Digital Production

Subject abbreviation: TFDP
College of Humanities, Arts, and Social Sciences

Robin Uriel Russin, M.F.A. Chair
tfdp.ucr.edu

Distinguished Professors
Patricia Cardoso, M.F.A.
Bella Merlin, Ph.D.

Professors
Kimberly Guerrero, M.F.A.
Rickerby Hinds, M.F.A.
Erith Jaffe-Berg, Ph.D.
Robin Russin, M.F.A.

Professors Emeriti
D. Eric Barr, M.F.A.
Charles Evered, M.F.A.
Haibo Yu, M.F.A.
Stuart Krieger, B.A.

Associate Professors
Donatella Galella, Ph.D.
Keunpyo Root Park, M.F.A.
Annika Speer, Ph.D.

Assistant Professor
Daphnie Sicre, Ph.D.
William Wohleb, M.F.A.

Assistant Professor of Teaching
Christophe Katrib, M.F.A.
Christopher Scott Murillo, M.F.A.
Megan Tabaque, M.F.A.

Continuing Lecturers
Michael Bucklin, M.F.A.
Louis Carazo, M.F.A.

Major

The Department of Theatre, Film, and Digital Production offers a B.A. in Theatre, Film, and Digital Production. The major focuses on three broad areas of theatre and film: literature, history, and criticism; performance, design, direction, and technology; and the elements of production. Students have the opportunity to write, perform, direct, and design. Four stages are available for rehearsals and performances: the 500-seat proscenium University Theatre, the 150-seat Studio Theatre in the Arts building with state-of-the-moment equipment for facilities, and the 120-seat Rehearsal Lab.

Students are able to practice acting in faculty-directed shows, student productions, and class presentations. Special projects and studies are offered for advanced students to produce an original work or to study in more depth acting, directing, scenic design, or playwriting.

As part of the Theatre, Film, and Digital Production Department's ongoing goal to provide a comprehensive and world-class program in the performing arts, a **Filmmaking Track** is offered for students who are primarily interested in pursuing the goal of becoming filmmakers. In addition to taking classes in filmmaking, screenwriting, acting, and technology, students will also take classes in literature and theory as requirements.

Student assistantships, work-study, Gluck Fellowships, and scholarships such as the Chancellor's Performance Award are available to students. For further information, call the Theatre, Film, and Digital Production Department, (951) 827-5568.

University Requirements

See Undergraduate Studies section.

College Requirements

See College of Humanities, Arts, and Social Sciences, Colleges and Programs section.

Major Requirements

The major requirements for the B.A. degree in Theatre, Film, and Digital Production are as follows:

Lower-division requirements (9 units)

1. TFDP 099
2. TFDP 020
3. Either TFDP 010, TFDP 021, TFDP 022, TFDP 050, TFDP 050S, TFDP 066, or TFDP 067

Track 1: Literature, History, Criticism and Dramaturgy

Upper-division requirements (40/44 units)

1. **Literature, History, Criticism and Dramaturgy requirement (20 units)**
   a) **Literature, History, and Criticism emphasis (12 units):** TFDP 100, TFDP 120A, TFDP 120B
      1) **Eight (8) additional units from** TFDP 121, TFDP 122, TFDP 123, TFDP 124A, TFDP 124B, TFDP 125 (E-Z), TFDP 127, TFDP 161, TFDP 177 or TFDP 177S, TFDP 191 (E-Z)
   b) **Dramaturgy emphasis (12 units):** TFDP 100, TFDP 120A, TFDP 120B
      1) **Eight (8) additional units from** TFDP 103, TFDP 121, TFDP 122, TFDP 123, TFDP 124A, TFDP 124B, TFDP 125 (E-Z), TFDP 127, TFDP 161, TFDP 177 or TFDP 177S, TFDP 191 (E-Z)
2. **Twelve (12) elective units from** TFDP 101, TFDP 102, TFDP 109, TFDP 110A, TFDP 115, TFDP 126A, TFDP 126B, TFDP 150A, TFDP 150B, TFDP 152, TFDP 164A/CRWT 164A, TFDP 167, TFDP 169, TFDP 185/MUS 185 or TFDP 185S/MUS 185S, TFDP 199
3. **Production requirement (8/12 units)**
   a) **Literature, History, and Criticism emphasis:** Eight (8) units from TFDP 170, TFDP 171, TFDP 172, TFDP 173, TFDP 174, or TFDP 175
   b) **Dramaturgy emphasis:** TFDP 174 (4 units) and eight (8) units from TFDP 170, TFDP 171, TFDP 172, TFDP 173, or TFDP 175

Track 2: Writing for the Performing Arts

Upper-division requirements (44 units)

1. **Literature, History, and Criticism (12 units)**
   a) TFDP 120A, TFDP 120B **(8 units)**
   b) **Four (4) units from** TFDP 122, TFDP 123, TFDP 124A, TFDP 124B, TFDP 125 (E-Z), TFDP 127, TFDP 191(E-Z)
2. **Writing for the Performing Arts (20 units)**
   a) TFDP 164A, TFDP 164B, TFDP 164C
   b TFDP 166A, TFDP 166B
3. **Eight (8) elective units from** TFDP 109, TFDP 110A, TFDP 114, TFDP 115, TFDP 150A, TFDP 150B, TFDP 152, TFDP 163, TFDP 165, TFDP 166C, TFDP 167, TFDP 169, TFDP 195, TFDP 198-I
4. **Production requirement:** Four (4) units from TFDP 170, TFDP 171, TFDP 172, TFDP 173, TFDP 174, or TFDP 175

Track 3: Filmmaking

Upper-division requirements (40 units)

1. **Filmmaking (16) units**
   a) TFDP 155 and TFDP 153A or TFDP 154 **(8 units)**
   b) **Eight (8) additional units from** TFDP 117, TFDP 130A, TFDP 130B, TFDP 142, TFDP 144, TFDP 151, TFDP 153B, TFDP 156A, TFDP 156B, TFDP 157, TFDP 159
2. **Screenwriting (4) units from** TFDP 163
3. **Twenty (20) elective units from** TFDP 100, TFDP 101, TFDP 109, TFDP 115, TFDP 120A, TFDP 120B, TFDP 122, TFDP 123, TFDP 133, TFDP 149, TFDP 150A, TFDP 150B, TFDP 152, TFDP 160, TFDP 161, TFDP 165, TFDP 167, TFDP 171, TFDP 172, TFDP 177 or TFDP 177S, TFDP 180 (E-Z), TFDP 185/MUS 185 or TFDP 185S/MUS 185S, TFDP 191(E-Z), TFDP 195, TFDP 198-I, TFDP 170, TFDP 173, TFDP 174, or TFDP 175

Track 4: Acting and Directing

Upper-division requirements (40-44 units)

1. **Acting/Directing (16 units)**
   a) **Acting emphasis:** TFDP 109, TFDP 110A, TFDP 110B (12 units)
      1) **Four (4) additional units from** TFDP 111A, TFDP 111B, TFDP 111C, TFDP 111D, TFDP 112 (E-Z), TFDP 113 (E-Z)
   b) **Directing emphasis:** TFDP 109, TFDP 150A, TFDP 150B (12 units)
      1) **Four (4) additional units from** TFDP 110A, TFDP 112 (E-Z), TFDP 113 (E-Z), TFDP 117, TFDP 153A, TFDP 154
2. **Literature History and Criticism (12 units):** TFDP 100, TFDP 120A, TFDP 120B
3. **Electives (4) units from** TFDP 066, TFDP 101, TFDP 110A, TFDP 110B, TFDP 111A, TFDP 111B, TFDP 111C, TFDP 111D, TFDP 112 (E-Z), TFDP 113 (E-Z), TFDP 115, TFDP 121, TFDP 122, TFDP 123, TFDP 124A, TFDP 124B, TFDP 125 (E-Z), TFDP 127, TFDP 136, TFDP 149, TFDP 150A, TFDP 150B, TFDP 152, TFDP 154, TFDP 155, TFDP 160, TFDP 161, TFDP 163, TFDP 185/MUS 185 or TFDP 185S/MUS 185S TFDP 177 or TFDP 177S, TFDP 180 (E-Z), TFDP 191 (E-Z), TFDP 195, TFDP 198-I
4. **Production requirement (8-12) units from** TFDP 170, TFDP 171, TFDP 172, TFDP 173, TFDP 174, or TFDP 175

Track 5: Production and Design

Upper-division requirements (40-44 units)

1. **Production and Design (16 units)**

a) TFDP 101 **(4 units)**

b) **Twelve (12) units from** TFDP 131, TFDP 132, TFDP 133, TFDP 135, TFDP 136, TFDP 142, TFDP 143, TFDP 145, TFDP 149, TFDP 180 (E-Z)

2. **Literature, History, and Criticism (12 units)**

a) TFDP 100 **(4 units)**

b) **Eight (8) units from** TFDP 120A, TFDP 120B, TFDP 121, TFDP 122, TFDP 124A, TFDP 124B, TFDP 125 (E-Z), TFDP 161, TFDP 176/DNCE 128/ANTH 128/AST 128, TFDP 177 or TFDP 177S, TFDP 191 (E-Z)

3. **Four (4 units) from** TFDP 109, TFDP 115, TFDP 150A, TFDP 150B, TFDP 152, TFDP 160, TFDP 195, TFDP 198-I
4. **Production requirement (8-12) units from** TFDP 170, TFDP 171, TFDP 172, TFDP 173, TFDP 174, or TFDP 175

Track 6: General Theatre, Film, and Digital Production

Upper-division requirements (40 units)

1. **Twelve (12) units of Literature, History, and Criticism:** TFDP 100, TFDP 120A, TFDP 120B
2. **Twelve (12) units of Additional Requirements from** TFDP 101, TFDP 103, TFDP 109, TFDP 121, TFDP 150A, TFDP 150B, TFDP 131, TFDP 132, TFDP 133, TFDP 135, TFDP 136, TFDP 138, TFDP 143, TFDP 145, TFDP 149, TFDP 153A, TFDP 154, TFDP 163, TFDP 164A/CRWT 164A, TFDP 166A
3. **Electives (8) eight units from** TFDP 115, TFDP 122, TFDP 124A, TFDP 124B, TFDP 125 (E-Z), TFDP 152, TFDP 161, TFDP 176/DNCE 128/ANTH 128/AST 128, TFDP 177 or TFDP 177S, TFDP 185/MUS 185 or TFDP 185S/MUS 185S, TFDP 180 (E-Z), TFDP 191 (E-Z), TFDP 195, TFDP 199
4. **Production requirement (8) units from** TFDP 170, TFDP 171, TFDP 172, TFDP 173, TFDP 174, or TFDP 175

Minor

The minor in Theatre, Film, and Digital Production follows the structure of the major requirements by exposing students to each of the areas that are essential to the creation of theatre and film, with the opportunity to take an additional course for depth or more exposure. The inclusion of production courses TFDP 170, TFDP 171, TFDP 172, TFDP 173, TFDP 174 and TFDP 175 gives the students the opportunity to put course work into the proper context and provides them with a practical understanding of the workings and problems of production. The minor in Theatre, Film, and Digital Production provides students with a basic understanding in major areas of study including performing arts literature, performance, and design. It also introduces the nonmajor to the discipline, providing breadth for those students majoring in unrelated disciplines.

Requirements for the minor (20 units)

1. **TFDP 100, TFDP 101, TFDP 109**
2. **Four (4) units from** TFDP 170, TFDP 171, TFDP 172, TFDP 173, TFDP 174 or TFDP 175
3. **One 4-unit upper-division course selected from** the department's Literature, History, Criticism area or the Performance, Direction, Playwriting, Screenwriting, Design, and Theatre Technology area.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Education Abroad

Education Abroad is an excellent opportunity to learn more about another country and its culture while taking courses to earn units toward graduation. Students should plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs officer for assistance. For further details, visit Education Abroad at ea.ucr.edu or call (951) 827-4113.

See Education Abroad in the Educational Opportunities section in the beginning of this catalog.

Graduate Program

The Department of Theatre, Film, and Digital Production in conjunction with the Department of Creative Writing offers the M.F.A. degree in Creative Writing and Writing for the Performing Arts. See Creative Writing and Writing for the Performing Arts in this catalog for more information and program requirements.

Lower-Division Courses

TFDP 010 Introduction to Acting 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none Introduction to acting in theatre, film, television, and performance art. Through exercises, lectures, videos, and on-site visits, explores the work of actors and their collaborations with other artists in historical and contemporary settings. Recommended for nonmajors.

TFDP 021 Introduction to Latinx Cultural Production On Stage and Screen 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to Latino theatre and film from 1965 to the present. Examines the major works of playwrights and important films and videos.

TFDP 022 Shakespeare in Performance 4 Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): none. A study of contemporary Shakespearean production on stage and film. Considers the problems of adapting the text, creating visual elements, speaking the language, and performing the characters. Explores a wide range of performance styles.

TFDP 023 A Study of Technical Production Practices,equipment and Architecture For Film and Digital Media 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): restricted to class level standing of freshman, or sophomore; or consent of instructor. A study of technical production practices, equipment, and architecture for Film and Digital Media. Explores the application of production practices and principles of film and media production.

TFDP 024 A Study of Technical Production Practices,equipment and Architecture For Theatre and Live Action 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): restricted to class level standing of freshman, or sophomore; or consent of instructor. A study of technical production practices, equipment, and architecture for theatre and live action. Explores the application of production practices and principles of stagecraft in relation to scenic, costume, lighting, sound, and projection design.

TFDP 042 Costume Construction 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): none. A theoretical and practical study of theatrical costume production. Topics include draping and flat pattern development, fabric, fitting, and sewing techniques. Costume projects are required. Sewing skills helpful but not essential.

TFDP 044 Makeup For Theatre, Film, and Television 4 Discussion, 4 hours, Prerequisite(s): none. A study of the theory and practice of makeup for theatre, film, and television. Includes demonstrations by industry professionals.

TFDP 050 Public Speaking 4 Lecture, 3 hours; studio, 3 hours. Covers the principles and practice of effective speech composition and delivery. Provides the communicative skills essential in professional careers and community life. Credit is awarded for one of the following TFDP 050 or TFDP 050S.

TFDP 050S Public Speaking 4 Lecture, 3 hours; discussion, 1 hour. Covers the principles and practice of effective speech composition and delivery. Provides the communicative skills essential in professional careers and community life. Credit is awarded for one of the following TFDP 050S or TFDP 050.

TFDP 066 Screenwriting: How Movies Work 4 Lecture, 3 hours; discussion, 1 hour; screening, 8 hours per quarter. Prerequisite(s): none. An Introduction to writing for stage and screen. Addresses structure, character, dialogue, theme, and story. Cross-listed with CRWT 066, and MCS 066.

TFDP 067 Introduction to Playwriting and Screenwriting 4 Workshop, 3 hours; written work, 3 hours; screening, group activity, 3 hours/quarter; screening, individual activity, 3 hours/quarter. Prerequisite(s): CRWT 066/MCS 066/TFDP 066 with a grade of "C-" or better or consent of instructor. An introduction to writing for stage and screen. Addresses structure, character, dialogue, theme, and story.

TFDP 099 Introduction to the Theatre Department 1 Lecture, 1 hour. Prerequisite(s): none. An introduction to the faculty and areas of study offered by the Department of Theatre. Promotes a better understanding of undergraduate opportunities, graduate training, and careers in the entertainment industry. Graded Satisfactory (S) or No Credit (NC).

Upper-Division Courses

TFDP 100 Play Analysis 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. In-depth analysis of selected plays. Explores structure, character, and imagery.

TFDP 101 Introduction to Design 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): TFDP 020; or consent of instructor. A comprehensive introduction to design for theatre, film, and television. Topics include design principles and practice of set, costume, and lighting. Includes the history of design and conceptual approaches and research.

TFDP 103 Introduction to Dramaturgy 4 Seminar, 4 hours. Prerequisite(s): TFDP 100; upper-division standing. Introduction to theatre dramaturgy, script analysis and advising for production. Topics include analyzing a dramatic text, researching production histories, preparing research materials for a production, season planning, lobby display, and working with new work.

TFDP 109 Acting: the Process 4 Lecture, 2 hours; workshop, 2 hours; written work, 1 hour; extra reading, 2 hours; individual study, 3 hours. Prerequisite(s): TFDP 099 or MCS 001; or consent of instructor. A comprehensive introduction to the process of acting. Topics include imagination, communication, and the psychophysical development of the actor's instrument. Explores basic approaches to the acting process through monologues and introductory scene study.

TFDP 110A Acting: Fundamentals 4 Lecture, 2 hours; workshop, 2 hours; activity, 2 hours; individual study, 3 hours; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): TFDP 109 with a grade of D or better; or consent of instructor. A study of the acting fundamentals and the actor's basic tool kit. Topics include text analysis, actions and activities, problems and objectives, and audition technique. Explores basic approaches to characterization through audition practice, monologues, and scene study using methods such as Stanislavsky's "system," the American Method, and Meisner Technique.

TFDP 110B Acting: Techniques 4 Lecture, 2 hours; workshop, 2 hours; activity, 2 hours; individual study, 3 hours; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): TFDP 110A; or consent of instructor. An examination of acting techniques from various global practitioners. Topics include advanced psychophysical work, advanced text analysis, the architecture of the stage space, and the actor-audience relationship in dynamic storytelling. Explores analysis and performance of scenes from a range of world dramas.

TFDP 111A Advanced Acting: Shakespeare and the Power of Language 4 Lecture, 2 hours; workshop, 2 hours; activity, 2 hours; individual study, 3 hours; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): TFDP 110B; or consent of instructor. Advanced scene study in classic theatre to develop the actor's skills with heightened language. Emphasizes works by Shakespeare. Topics include performance styles, working on text and voice, and the power of images.

TFDP 111B Advanced Acting: Acting With Facts and Playing With the Truth 4 Lecture, 2 hours; workshop, 2 hours; activity, 2 hours; individual study, 3 hours; extra reading, 3 hours. Prerequisite(s): TFDP 110B; or consent of instructor. Advanced scene study in world theatre of the realistic mode to expand the actor's emotional repertoire, character range, and worldview. Includes in text and subtext, performance styles in fact-based and verbatim dramas, and the nature of truth in acting. Explores realism from Anton Chekhov to Anna Deavere Smith.

TFDP 111C Advanced Acting: Acting For the Camera 4 Lecture, 2 hours; studio, 4 hours. Prerequisite(s): TFDP 110B; or consent of instructor. A practical exploration of acting for camera. Topics include technicalities of performing for screen, adaptation of interpretative acting tools to performance from stage to screen, and auditioning for camera. Explores analysis of film/television scripts, recorded performance to camera, and analysis of iconic screen performances.

TFDP 111D Advanced Acting: the Business of Acting 4 Lecture, 2 hours; workshop, 2 hours; activity, 3 hours; individual study, 3 hours; written work, 1 hour; extra reading, 2 hours. Prerequisite(s): TFDP 111A or TFDP 111B or TFDP 111C; or consent of instructor. Examines professional strategies of the working actor. Topics include analysis of the casting process, portfolio creation (headshot, resume, reel), audition techniques, and business strategies and protocols.

TFDP 112 (E-Z) 4 Lecture, 2 hours. Study in voice, vocal performance techniques, and theories for actors.

TFDP 112E Dramatic Interpretation 4 Lecture, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Vocal presentation of text. Includes the use of various literary forms emphasizing rhythm, tonality, diction, imagery, focus, and phrasing as implements to convey the text, character, actions, and intentions.

TFDP 112F Voice and Diction 4 Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. The study of vocal production for actors. Focuses on breathing, relaxation, articulation, communication, and projection, enabling the actor to fill a theatre with clear, understandable speech. Also examines the International Phonetic Alphabet to assist in pronunciation.

TFDP 113 (E-Z) Movement For Actors and Performers 4 Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior. A study of movement techniques and theories for actors and performers. F. Stage Combat; M. Mime; N. Nonverbal Theatre.

TFDP 114 Acting For Writers 4 Lecture, 2 hours; discussion, 2 hours; research, 2 hours. Prerequisite(s): CRWT 164C or TFDP 164C or TFDP 166C; or consent of instructor. Examines the theory and practice of acting to enable writers to better understand how language reflects character, as well as how actors turn the written word into spoken language. Includes text work and improvisation. Credit is awarded for one of the following TFDP 114 or CWPA 214.

TFDP 115 Hip Hop Theatre 4 Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): upper-division standing or consent of instructor. Provides tools to create new work by using elements of hip hop culture such as Graffiti Art, Emceein' (rappin'), DeeJayin' and Breakdancin' as primary means of storytelling on stage. Explores theoretical aspects of hip hop culture and a working knowledge of playwriting, acting, directing, and design.

TFDP 117 Directing For the Screen 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): TFDP 144; or consent of instructor. An introduction to the study of film directing from the perspective of film analysis and filmmaking practice. Explores the job of the director in the realms directors control: narrative form, mise-en-scene, cinematography, sound, and editing.

TFDP 120A Literature and History of the Theatre: the Classical Period Through the Italian Renaissance 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the literature and history of the theatre from the classical period through the Italian Renaissance. Focuses on analysis of representative plays, theatrical architecture, and production modes.

TFDP 120B Literature and History of the Theatre: the Elizabethan Period Through the Nineteenth-Century 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the literature and history of the theatre from the Elizabethan period through the nineteenth century. Focuses on analysis of representative plays, theatrical architecture, and production modes.

TFDP 121 Dramaturgy: World of the Play 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of a significant play in the context of the social, intellectual, and artistic movements of its time. Offered simultaneously with the Theatre Department's production of the play. May also consider related works and writings. Course is repeatable as content changes to a maximum of 8 units.

TFDP 122 Theatre For Social Change 4 Lecture, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines theatre for social change as created by grassroots theatrical organizations. Focuses on how community-based theatre groups develop works and how theatre in public or private spaces redefines traditional theatre practices.

TFDP 123 Asian/American Theatre: Disorienting the Stage 4 Seminar, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the histories, theories and texts of Asian/American theatre. Explores themes such as Orientalism, imperialism, and immigration.

TFDP 124A American Theatre, 1900-1945 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examination of the major American playwrights, theatrical figures, and movements from 1900 through World War II.

TFDP 124B American Theatre, 1945-Present 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Examination of the major American playwrights, theatrical figures, and movements from World War II to the present.

TFDP 125 (E-Z) History of the Theatre 4 Lecture, 4 hours. A study of the plays, playhouses, and players of the following theatrical eras: E. Classical Theatre; F. Medieval Theatre; G. Renaissance Theatre; I. Romantic Theatre; J. Realistic Theatre; K. Contemporary Theatre; M. American Theatre; N. Neo-classic Theatre; P. American Theatre And Drama Of The Great Depression; S. American Musical Theatre; T. Asian Theatre; X. Experimental Theatre In America. Course is repeatable.

TFDP 126A History of Dress 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of the psychological, sociological, and economic history of fashion and dress from 4000 B.C. to A.D. 1700.

TFDP 126B History of Dress 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. A study of the psychological, sociological, and economic history of fashion and dress from A.D. 1700 to the present.

TFDP 127 Theories of the Modern Theatre 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the major theories underlying twentieth-century theatre practice. Special attention is paid to the ideas of important theatre artists such as Konstantin Stanislavsky, E. Gordon Craig, Antonin Artaud, and Bertolt Brecht.

TFDP 128 Seminar On the Life and Work of Tomas Rivera 4 Seminar, 3 hours; research, 3 hours. Prerequisite(s): consent of instructor. Introduction to the life and work of Tomas Rivera, UCR Chancellor (1979-1984) and foundational Chicana/o author. Explores the breadth of Rivera's writing (novel, poems, short stories, speeches) and his contributions through administrative leadership in higher education as well as personal papers in the UCR Tomas Rivera Archives in Special Collections.

TFDP 129 History of the Modern Theatre: Nineteenth-Century - Present 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): upper-division standing. Introduces the main developments in modern theatre from a global perspective. Explores major historical developments in theatre as a response to globalization, colonization, feminism, and other cultural developments. Course is repeatable as content changes to a maximum of 8 units.

TFDP 130A Producing Short Episodic Content A 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): TFDP 144 or TFDP 153B or TFDP 156A or TFDP 156B; or consent of instructor. Introduces techniques involved in producing a pilot for a short episodic content series in video. Reviews the entire production cycle for a pilot including casting and location scouting, working with actors, shooting, and editing.

TFDP 130B Producing Short Episodic Content B 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): TFDP 144 or TFDP 153B or TFDP 156A or TFDP 156B; or consent of instructor. Covers techniques and skills needed for producing episodes of a short episodic content series in video. Reviews the entire production cycle for two episodes including producing, directing, photographing, and editing.

TFDP 131 Sound Design For Theatre, Film, and Television 4 Lecture, 2 hours; workshop, 2 hours. Prerequisite(s): TFDP 101; or consent of instructor. Introduces sound design for theatre, film, and television productions. Covers topics such as critical listening, psycho acoustics, computer editing, sound recording and processing, and copyright laws pertaining to sampling.

TFDP 132 Lighting Design For Theatre, Film, and Television 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): TFDP 101; or consent of instructor. A study of design, technical production practices, and equipment for lighting in theatre, film, and television. Explores the application of production practices and principles of designing light for entertainment. Develops skills associated with the creation and execution of a lighting design.

TFDP 133 Scene Design For Theatre, Film, and Television 4 Lecture, 4 hours. Prerequisite(s): TFDP 101; or consent of instructor. An introduction to basic skills and techniques for theatre design and to issues of contemporary design for theatre, film, and television. Topics include sketching, rendering, drafting, and model making.

TFDP 135 Costume Design For Theatre, Film, and Television 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): TFDP 101; or consent of instructor. A study of theory, principles, and practice of costume design for theatre, film, and television.

TFDP 136 History of Theatre Design 4 Lecture, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the development of scenic, costume, lighting, and sound design in theatre. Examines different styles of theatrical aesthetics throughout history focusing on Western culture.

TFDP 138 Art Direction For Film and Television 4 Lecture, 3 hours; individual study, 1.5 hours; screening 1.5 hours. Prerequisite(s): TFDP 101 or consent of instructor. An introduction to the design principles and methods professional art directors use in the entertainment industry. Projects related to feature film and television design explore current methods of presentation and composition for the film and television camera.

TFDP 142 The Art of Film 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): TFDP 155; or consent of instructor. An introduction to the analysis of cinema. Topics include film forms, genres, and Mise-en-Scene. Examines how creative choices by filmmakers affect what viewers experience and how they respond. Develops the skills of watching and listening closely that are necessary to become informed filmmakers.

TFDP 143 Scene Painting 4 Lecture, 2 hours; studio, 2 hours; individual study, 3 hours. Prerequisite(s): TFDP 020; or consent of instructor. Explores and applies techniques and materials used to create the various elements of scene design. Includes methods of set preparation, coating, mixing, palette preparation, spraying, transfer, texturing, finishing, and wall papering.

TFDP 144 Directing Actors For the Screen 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): TFDP 155; or consent of instructor. Develops skills needed to direct actors for the screen. Topics include communication, breaking down screenplays, identifying characters' objectives and arcs, and blocking actors for the camera. Studies giving directions using action verbs, facts, imagination, and physical activities. Students will learn by directing and acting in scenes.

TFDP 145 Computer Aided Design For Theatre, Film, and Television 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): TFDP 101 or TFDP 020 or consent of instructor. Explores the established computer-aided design (CAD) applications in the design industry: 3DS Studio Max, Adobe Photoshop, and Vectorworks.

TFDP 149 Stage Management 4 Lecture, 4 hours. Prerequisite(s): TFDP 099. Explores the role and function of the stage manager in theatrical production. Provides basic skills to work in the field of stage management emphasizing organization, documentation, and dissemination of information.

TFDP 150A Directing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): TFDP 099; or consent of instructor. Introduces directing for theater and film. Includes analyzing texts, preparing a rehearsal schedule, communicating with actors and designers, blocking scenes, utilizing space and lighting, and introducing concepts for directing projects. Also proposes various theories of directing.

TFDP 150B Directing 4 Lecture, 4 hours. Prerequisite(s): TFDP 150A or consent of instructor. An examination of the rehearsal

process focusing on combining the elements of text, acting, and design.

TFDP 151 Transition to the Film Industry 4 Lecture, 3 hours; laboratory, 3 hours; research, 1 hour; screening, 1 hour; written work, 1 hour. Prerequisite(s): TFDP 155; restricted to class level standing of junior, or senior; or consent of instructor. Involves creating a plan for transition into professional life after college. Determines short- and long-term career and academic goals and develops strategies to achieve them. Explores diverse avenues to enter the film industry.

TFDP 152 Advanced Public Speaking 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): TFDP 050 or TFDP 050S; or consent of instructor. An intense practice-based laboratory in communication, rhetoric, and delivery. Designed to strengthen practical and professional skills in conducting research, crafting presentations for diverse interdisciplinary audiences, and dynamic delivery. Includes visual rhetoric, online presentations, argument, debate, and preparation for the written materials and impromptu speech necessary to thrive in job interviews.

TFDP 153A Introduction to Cinematography 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): TFDP 020; restricted to class level standing of junior, or senior; or consent of instructor. Introduces basic operations and skills of cameras, lighting, and lenses. Emphasizes aesthetics of cinematography, including image control through lighting, exposure, and film equipment.

TFDP 153B Advanced Cinematography 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): TFDP 153A; or consent of instructor. Addresses visual perception through practice with a variety of lenses, light fixtures, cameras, and formats. Focuses on cinematic thought in both documentary and dramatic work. Includes practical film exercises designed to develop more creative and personal expression.

TFDP 154 Introduction to Filmmaking 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): TFDP 020; restricted to class level standing of junior, or senior; or consent of instructor. Introduces filmmaking, basic elements of film sets, functions and terminology of various roles on a film set, and mechanics of the film industry.

TFDP 155 Introduction to Digital Film Production 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): CRWT 066 or MCS 066 or TFDP 066: TFDP 020; restricted to class level standing of junior, or senior; or consent of instructor. Introduces the skills needed for making a narrative film. Includes examining and utilizing scripts, cameras, lighting, sound, and editing. Also includes filmmaking projects.

TFDP 156A Digital Film Production 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): TFDP 153A with a grade of C- or better or TFDP 155; or consent of instructor. Examines the techniques of narrative filmmaking and directing for the camera. Emphasizes the working relationship with actors.

TFDP 156B Digital Film Production 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): TFDP 155 or TFDP 156A. Examines the techniques of production and postproduction for narrative filmmaking. Emphasizes sound and editing processes.

TFDP 157 Introduction to Film Editing 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): TFDP 153A or TFDP 154 or TFDP 155; restricted to class level standing of junior, or senior; or consent of instructor. Examines the art and craft of editing the narrative film. Includes hands-on work in editing a montage, a short documentary, and a narrative fiction scene.

TFDP 158 Storytelling of Witness: Introduction to Documentary Theatre and Film 4 Lecture, 3 hours; screening, 2 hours; research, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. Introduces vocabulary, themes, genres, and methods of documentary storytelling in theater and film. Explores the evolution of documentary storytelling focusing on signature works by noted playwrights and filmmakers. Addresses craft, voice, and legacy of documentary storytelling from strictly recorded (verite, interview) to creatively devised narratives (post-event recreation, hybrid forms).

TFDP 159 Documentary Production 4 Workshop, 3 hours; laboratory, 3 hours. Prerequisite(s): TFDP 153A or TFDP 154 or TFDP 155; or consent of instructor. Creation of independent, low-budget documentaries through hands-on experience in pre-production, production, and post-production. Presents works in progress and finished pieces throughout the quarter. Considers peer feedback.

TFDP 160 The Filmmaker's Life 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An overview of the various jobs (and their requirements) connected to the process of creating products for film and television entities.

TFDP 161 African American Drama 4 Lecture, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the major African American plays and playwrights from the 1800s to the present.

TFDP 162 Writing the Half-Hour Television Comedy 4 Workshop, 3 hours; written work, 3 hours. Prerequisite(s): TFDP 166A or consent of instructor. Introduction to the style, form, content, and creation of a half-hour television comedy series.

TFDP 163 Writing the Short Film 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): TFDP 066 or CRWT 066 or MCS 066, TFDP 153A or TFDP 154; or consent of instructor. Addresses the mechanical and creative components of crafting a screenplay for a short film.

TFDP 164A Beginning Playwriting 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): CRWT 056 or TFDP 100 or consent of instructor. Seminar in the practice of playwriting centering on the construction of a plot. Cross-listed with CRWT 164A.

TFDP 164B Intermediate Playwriting 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): CRWT 164A/TFDP 164A. Seminar in the practice of playwriting. Revisions of works in progress emphasizing character development and techniques for writing dialogue. Cross-listed with CRWT 164B.

TFDP 164C Advanced Playwriting 4 Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): CRWT 164B/TFDP 164B. Seminar in the practice of playwriting. Includes playwrights' participation in staged readings of their work. With consent of instructor, course is repeatable to a maximum of 8 units. Cross-listed with CRWT 164C.

TFDP 165 Creating the Webseries 4 Workshop, 3 hours; written work, 3 hours. Prerequisite(s): TFDP 166B; or consent of instructor. An introduction to the demands and processes of creating and writing a web series. Designed to produce a full season of fifteen to twenty five-minute episodes. Course is repeatable to a maximum of 8 units.

TFDP 166A Screenwriting: Introduction 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): CRWT 066 or MCS 066 or TFDP 066, TFDP 020; or consent of instructor. An introduction to the process and craft of screenwriting. Includes developing and presenting an idea for a screenplay created over the breadth of this three-part series TFDP 166A, TFDP 166B, TFDP 166C. TFDP 166A includes creation of an outline for the entire screenplay and the writing of the first act.

TFDP 166B Screenwriting: Outline to First Draft 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): TFDP 166A; or consent of instructor. An introduction to the process and craft of screenwriting. Continues to develop the idea of the screenplay began in TFDP 166A. Utilizes the previously created outline and first act to write Act 2 and Act 3 and produce a complete rough draft.

TFDP 166C Screenwriting: Rewrites and Writing For Television 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): TFDP 166B; or consent of instructor. An introduction to the process and craft of screenwriting. Includes a page one rewrite of the screenplay developed in TFDP 166A and TFDP 166B. Teaches the rewriting process utilizing notes provided in TFDP 166A and TFDP 166B and instructor input to further develop the original screenplay. Course is repeatable to a maximum of 8 units.

TFDP 167 Writing For Television: Creating the One-Hour Series Drama 4 Seminar, 3 hours; written work, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. Introduces the craft of writing for television focusing on production of original work. Includes writing a one-hour pilot, creating series guidelines, and formulating

work leading to a 13-episode series. Course is repeatable to a maximum of 12 units.

TFDP 169 Rewriting the Script 4 Workshop, 4 hours. Prerequisite(s): CRWT 164C/TFDP 164C or TFDP 166C; consent of instructor is required for students repeating the course. Covers rewriting a full-length script (screenplay or play). Course is repeatable to a maximum of 8 units. Credit is awarded for only one of CWPA 269 or TFDP 169.

TFDP 170 Performance in Production 1 to 4 Studio, 5 to 20 hours. Prerequisite(s): permission by department. Students act in full productions. Students are cast in roles and throughout the rehearsal period are taught by the director how to perform their assigned roles in a professional manner. Course is repeatable to a maximum of 32 units.

TFDP 171 Technical Production 1 to 4 Studio, 5 to 20 hours. Prerequisite(s): permission by department. Provides training to serve in various capacities on theatre or film production crews. Includes work in assigned crew positions on departmental productions during pre-production, rehearsals, performances, and post-production. Course is repeatable to a maximum of 32 units.

TFDP 172 Design in Production 1 to 4 Studio, 5 to 20 hours. Prerequisite(s): permission by department. Provides training to be a designer on theatre or film productions. Includes work with a mentor designer on departmental productions throughout pre-production, production, and post-production. Course is repeatable to a maximum of 32 units.

TFDP 173 Management and Directing in Production 1 to 5 Studio, 5 to 25 hours. Prerequisite(s): permission by department. Provides training to become stage managers, production managers, and directors on theatre and film productions. Includes attending production meetings, rehearsals, and performances of departmental productions. Course is repeatable to a maximum of 32 units.

TFDP 174 Writing and Dramaturgy in Production 1 to 4 Studio, 5 to 20 hours. Prerequisite(s): permission by department. Provides training to write scripts or serve as a dramaturge on theatre and film productions. Includes working with a mentor on departmental productions during the pre-production process and attending some rehearsals and performances. Course is repeatable as content or topic changes to a maximum of 32 units.

TFDP 175 Fabrication in Production 1 to 4 Studio, 5 to 20 hours. Prerequisite(s): permission by department. Teaches fabrication while working in the scene shop, costume shop, or the lighting/sound shop during the build process of theatre or film productions. Course is repeatable to a maximum of 32 units.

TFDP 176 Performing Arts of Asia 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theatre, and ritual in four major geocultural regions of Asia: Central, East, South and Southeast. No Western music training is required. Course is repeatable to a maximum of 8 units. Cross-listed with ANTH 128, AST 128, and DNCE 128.

TFDP 177 Staging the Middle East 4 Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s):upper-division standing or consent of instructor. Examines the ways in which theatre, performance, and film engage with and critique the representations of peoples and cultures of the Middle East. Includes films and plays from the region as well as the work of Americans representing the Middle East. Credit is awarded for only one of TFDP 177 or TFDP 177S.

TFDP 177S Staging the Middle East 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s):upper-division standing or consent of instructor. Examines the ways in which theatre, performance, and film engage with and critique the representations of peoples and cultures of the Middle East. Includes films and plays from the region as well as the work of Americans representing the Middle East. Credit is awarded for only one of TFDP 177 or TFDP 177S.

TFDP 180 (E-Z) Theatre Practicum 4 Discussion, 4 hours. Prerequisite(s): restricted to class level standing of junior, or senior. An investigation of theatrical production theories and practices. E. Contemporary Mexican Theatre; F. Musical Comedy; M. Arts Management; Q. Plays In Progress; R. New Plays; S. Improvisation.

TFDP 185 Arts, Management, and Community 4 Lecture, 4 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to business and arts management including the study of film and television production, stage management, and music production. Offers hands-on

experience for practicing management skills working in partnership with local organizations and artists of Riverside and the Inland Empire. Cross-listed with MUS 185. Credit is awarded for only one of MUS 185/TFDP 185 or MUS 185S/TFDP 185S.

TFDP 185S Arts, Management, and Community 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to business and arts management including the study of film and television production, stage management, and music production. Offers hands-on experience for practicing management skills working in partnership with local organizations and artists of Riverside and the Inland Empire. Cross-listed with MUS 185S. Credit is awarded for only one of MUS 185/TFDP 185 or MUS 185S/TFDP 185S.

TFDP 186 Virtual Reality, Augmented Reality, and Mixed Reality Design and Production 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): TFDP 020, TFDP 066; restricted to class level standing of junior, or senior; or consent of instructor. Topics include historical examples of immersive technologies, VR/AR/MR projects, the social impact of VR/AR/MR concepts and projects, and the broader impact on society.

TFDP 190 Special Studies 1 to 5 Research, 3 to 15 hours. Prerequisite(s): consent of the chair of the department. Independent study and research by qualified undergraduate students under supervision of a faculty member. Course is repeatable to a maximum of 20 units.

TFDP 191 (E-Z) Seminar in Theatre 4 Seminar, 3 hours; extra reading, 3 hours. Covers various topics on a rotating basis. Includes playwriting, acting, directing, scenic design, theatre history, and dramatic literature. E. Hamlet: Who Is Hamlet And Why Should You Care?; M. American Frontier In American Drama; N. Theatre Of Eugene O' S. Script To Production; T. Women In Theatre: Theory And Performance.

TFDP 195 Senior Thesis 1 to 4 Thesis, 3 to 12 hours. Prerequisite(s): senior standing; consent of Department Chair. Open by invitation only Presentation of a significant piece of creative work with faculty supervision. Course is repeatable to a maximum of 8 units.

TFDP 198I Individual Internship in Theatre 1 to 12 Internship, 3 to 36 hours, reading and written work, 1-12 hours, Prerequisite(s): upper-division standing; consent of instructor. An internship in a theatre, television, or film production company. Includes work with directors or designers in one or more areas of professional production such as acting, design, costumes, lighting, and sound. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units.

TFDP 199 Senior Research 1 to 4 Research, 3 to 12 hours. Prerequisite(s): consent of chair of the department. Research in the practice and/or theory of the theatre. Open to seniors by invitation only.

University Honors

Subject abbreviation: HNPG
Division of Undergraduate Education

Begoña Echeverria, Ph.D.,
Howard H Hays, Jr. Endowed Chair and Associate Dean and Faculty Director of University Honors
381 Skye Hall
(951) 827-5323; honors@ucr.edu
honors.ucr.edu

Outstanding students from all majors can participate in University Honors. University Honors challenges students to take an active role in shaping their education through a variety of curricular, co-curricular, extra-curricular, and service-learning opportunities. Students benefit from University Honors staff support, in the areas of academic counseling, professional development, and guidance on applying for internships, fellowships, awards, and graduate or professional school. A study room and student lounge are available to University Honors students.

First-Year Experience

Admission to the first-year cohort in University Honors is based on high school grade point average and the successful completion of a University Honors admission application. During the first-year, students take required University Honors courses, participate in University Honors programs and events, and receive guidance from University Honors Ambassadors. First-year courses expose students to innovative teaching methods, interdisciplinary thinking, and increased depth of course content. One goal of University Honors courses is to expose students to methods of conceptualizing issues and framing questions that promote scholarship, engagement, and student success.

Second-Year Experience

The second-year cohort in University Honors is designed to expose students to the concept of civic engagement and to introduce them to the abundance of opportunities available to undergraduate students at UC Riverside. During the second-year, students engage in scholarly experiences that will allow them to interact with faculty members and begin considering topics for their eventual capstone projects. The second-year cohort consists of continuing first-year University Honors students, as well as high-achieving UCR students who did not have the opportunity to participate in the first-year cohort. Admission to the second-year cohort is based on a specified UCR cumulative grade point average and the successful completion of a University Honors admission application.

Upper-Division Experience

The upper-division curriculum provides students with the framework to produce a capstone project, resulting from faculty-mentored, undergraduate research, creative activity, or experiential learning. This structure is adaptable to almost any major and allows each student the flexibility to work with a faculty-mentor to shape a research, creative activity, or experiential learning program to meet the ambitions of the project. University Honors provides resources to assist students with finding a faculty-mentor and guidance throughout the process of completing the capstone project. Continuing UCR students with an excellent academic record may apply to participate in University Honors. Students who transfer to UCR as juniors with excellent academic records may also apply to University Honors. During the junior year, students narrow their research, creative activity, or experiential learning focus, select a faculty-mentor, and prepare to undertake the capstone project. The program provides support in all phases of this planning. The capstone project is usually undertaken by the spring quarter of the junior year and is completed well before graduation. The completed capstone project is submitted to the student's faculty-mentor for approval. Completion of an approved capstone project, and satisfaction of all other University Honors requirements, will qualify a student for graduation with University Honors distinction, which is noted on the official transcript.

Lower-Division Courses

HNPG 002W Principles of Civic Engagement 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in WRIT 040X; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better; admission to University Honors. Aims to cultivate, enhance, and facilitate interest in social change. Bridges the academic and personal life by providing knowledge and tools for civic engagement. Fulfills the third-quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to WRIT 030. Satisfactory(S) or No Credit(N/C) is not available.

HNPG 003 Implementing Civic Engagement 1 1 Workshop, 1 hour. Prerequisite(s): HNPG 002W with a grade of B or better; admission to University Honors. Guides through the initiation, planning, research, and implementation of a civic engagement plan. Applies the principles of civic engagement towards creating social change on campus and in the community. Satisfactory(S) or No Credit(N/C) is not available.

HNPG 004 Implementing Civic Engagement 2 1 Workshop, 1 hour. Prerequisite(s): HNPG 003 with a grade of B or better; admission to University Honors. Continues the process of working on the research, implementation, assessment, and presentation of a selected civic engagement project initiated in HNPG 003.

HNPG 010 First-Year Colloquium 1 Colloquium, 1 hour. Prerequisite(s): open only to students in the University Honors Program who are freshmen or first-year transfer students. Introduces students to academic research conducted by UCR faculty. Presentations are multidisciplinary and cover the sciences, humanities, and social sciences. Graded Satisfactory (S) or No Credit (NC).

HNPG 016 Ignition Seminar in Humanities 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): admission to University Honors. Addresses interdisciplinary topics drawn from the humanities. Topics vary from quarter to quarter. Satisfactory(S) or No Credit(N/C) is not available.

HNPG 017 Ignition Seminar in Social Sciences 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): admission to University Honors. Addresses interdisciplinary topics drawn from the Social Sciences. Topics vary from quarter to quarter. Satisfactory(S) or No Credit(N/C) is not available.

HNPG 018 Ignition Seminar in Interdisciplinary Studies 4 Seminar, 3 hours; activity, 3 hours. Prerequisite(s): admission to University Honors. Addresses interdisciplinary topics drawn from the humanities and social sciences. Topics vary from quarter to quarter. Satisfactory(S) or No Credit(N/C) is not available.

HNPG 090 Special Studies 2 to 4 Consultation, 1 hour; research, 6 to 12 hours. Prerequisite(s): admission to University Honors or consent of instructor; a written proposal approved by the program chair. Structured to meet specific educational needs. Addresses course content, style, and requirements determined in collaboration with the instructor. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 4 units.

HNPG 098I Honors Individual Internship 2 to 4 Consultation, 1 to 2 hours; internship, 4 to 8 hours; written work, 1 to 2 hours. Prerequisite(s): admission to University Honors or consent of instructor. Internship placement on or off campus that provides opportunities to acquire skills and experience for future endeavors. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 4 units.

Upper-Division Courses

HNPG 149 Introduction to the Honors Capstone 1 Lecture, 1 hour. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior; admission to University Honors. An introduction to the capstone experience as directed by the Honors Faculty Director. Covers effective networking, identifying and contacting a faculty-mentor, capstone planning, proposal writing, human subjects requirements, and successful completion of University Honors. Includes identifying a faculty-mentor and providing a brief description of the project. Graded Satisfactory (S) or No Credit (NC).

HNPG 150 Research and Creative Activity Across the Disciplines 3 Lecture, 1 hour; discussion, 1 hour; workshop, 1 hour. Prerequisite(s): HNPG 149 with a grade of S or better; restricted to class level standing of sophomore, junior, or senior; admission to University Honors. Addresses the following questions: "What is knowledge?" and "What is research?" Illustrates how researchers select a significant issue, review what is

known, and pose a research question whose answer promises to advance knowledge across the humanities, social sciences, and natural sciences. Focuses on development of the capstone proposal and prospectus. Satisfactory(S) or No Credit(N/C) is not available.

HNPG 190 Special Studies 1 to 4 Consultation, 1 hour; research, 3 to 12, Prerequisite(s): good standing; admission to upper-division University Honors or consent of instructor; a written proposal approved by the program chair. Structured to meet specific educational needs. Addresses course content, style, and requirements determined in collaboration with the instructor. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 12 units.

HNPG 197H Honors Research For Undergraduates 1 to 4 Research, 3 to 6 hours; individual study, 3 to 6 hours. Prerequisite(s): admission to University Honors or consent of instructor; upper-division standing. An introduction to research under the supervision of University Honors Program faculty. Requires a research project. Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 12 units.

HNPG 198H Junior Honors Research 1 Research, 3 hours. Prerequisite(s): HNPG 150 with a grade of D - or better; restricted to class level standing of sophomore, junior, or senior; admission to University Honors. Research in support of the University Honors capstone project under supervision of a faculty-mentor. Letter grade only. Satisfactory (S) or No Credit is not available.

HNPG 198I Honors Individual Internship 1 to 4 Consultation, 1 hour; internship, 3 to 12 hours; written work, 1 to 4 hours. Prerequisite(s): admission to University Honors or consent of instructor; upper-division standing. Internship placement on or off campus that provides opportunities to acquire skills and experience for future endeavors. Students who submit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 12 units.

HNPG 199H Senior Honors Research 1 to 5 Research, 2 to 10 hours; term paper, 1 to 5 hours. Prerequisite(s): HNPG 198H with a grade of B or better; restricted to class level standing of sophomore, junior, or senior; admission to University Honors. Research in support of the University Honors capstone project under supervision of a faculty mentor. Graded In Progress (IP) until the final quarter is completed, at which time a final grade is awarded. Course is repeatable to a maximum of 12 units.

Urban Studies Minor

Subject abbreviation: URST
College of Humanities, Arts, and Social Sciences

Patricia Morton, Ph.D., Chair
Office, INTS 3110
(951) 827-2698;
chassstudentaffairs.ucr.edu

Committee in Charge

Pat Morton (Media and Cultural Studies)
Daryle Williams, Dean, *ex officio*

The Urban Studies minor is an adaptation of a well-developed interdisciplinary focus on urban concepts, issues, and problems in order to offer the chance for increased understanding of urban processes. The minor also provides preparation leading to increased employment opportunities at the municipal, state, or federal level, or to graduate work in one of several areas related to urban studies.

Requirements for the minor (24 units)

1. SOC 002F
2. URST 143/SOC 143
3. URST 146/ECON 146
4. URST 172/POSC 172
5. URST 182/SOC 182
6. URST 184/AHS 184

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Lower-Division Courses

URST 014 Popular Musics of the World 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. Introduction to issues surrounding popular and urban musics of the world focusing on three major geocultural areas: Africa, Asia, and the Americas. Emphasizes the relationship between mass-mediated music and issues of cultural hegemony, resistance, and subversion. Analyzes the cultural impact of media technology on music performance and reception. Cross-listed with ETST 014, and MUS 014.

URST 025 Introduction to the Built Environment: Suburbia 4 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Introduces the history of suburbia from the Industrial Revolution to the present. Includes the rise of suburbs in England; classic suburbs in the United States; the spread of suburbs and mass transportation; the role of race and gender in suburbia; suburban sprawl in Southern California; and sustainability and suburban development. Cross-listed with MCS 025.

URST 069 The Politics of Public Space 4 Lecture, 3 hours; discussion, 1 hour; individual study, 3 hours. Prerequisite(s): none. Introduces theories and history of public space in modern cities. Topics include public space during the Industrial Revolution; modern planning and urban renewal; political uses of public space including demonstrations and occupations; privatization and policing of public spaces; and changing concepts of public and private space in contemporary society. Cross-listed with MCS 069.

Upper-Division Courses

URST 143 Urban Sociology 5 Lecture, 3 hours; extra reading, 3 hours; field, 3 hours. Prerequisite(s): SOC 001 or SOC 001H or consent of instructor. A comparative examination of metropolitan and other urban communities, with emphasis on processes of urbanization. Cross-listed with SOC 143.

URST 146 Urban Economics 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): ECON 102 or ECON 104A. Applies basic microeconomic principles to the spatial concentration of economic activity, the operation of the urban land, housing, transportation, and labor markets, the role of government in the urban economy, and urban economic problems, including pollution, crime, and homelessness. Cross-listed with ECON 146.

URST 159 Race, Space, and Identity 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): restricted to class level standing of junior, or senior; or consent of instructor. Examines the intersection of race, space, and identity in modern and contemporary culture. Explores the critical and constitutive importance of race in the built environment. Topics include the racialization of space; colonialism and colonial cities; expositions and world's fairs; segregation; race and the canon; decolonization; and urban renewal. Cross-listed with MCS 159.

URST 178 The Modern City 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): Restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Examines the modern metropolis from the Industrial Revolution to the present. Explores the history and theory of modern urbanism through case studies of metropolitan areas with a rich urban culture, architecture, and morphologic features. Investigates approaches to the problems of the large urban agglomeration in the context of social Cross-listed with AHS 178.

URST 182 Urban Problems 4 Lecture, 3 hours; discussion, 1 hour; term paper, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior. An interdisciplinary examination of selected urban problems such as civil disorders, transportation, housing, welfare, and planning. Cross-listed with PBPL 182, and SOC 182. Credit is awarded for one of the following PBPL 182, SOC 182, URST 182, or PBPL 178.

URST 184 Modern Architecture 4 Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): sophomore, junior, or senior standing; or consent of instructor. Explores modern architecture and its sources from 1800 to the present. Cross-listed with AHS 184.

Visual Arts

See Art (Graduate Program)

Western American Studies Minor

College of Humanities, Arts, and Social Sciences

Clifford E. Trafzer, Ph.D., Chair
Office, 1212 Humanities and Social Sciences
(951) 827-5401
westernamericanstudies.ucr.edu

Committee in Charge

Cliff Trafzer, Chair (History)
Rebecca Kugel (History)
Michelle Raheja (English)
Jason Weems (History of Art)
Daryle Williams, Dean, *ex officio*

The Western American Studies minor is intended to provide the student with a basic understanding of the history and institutional development of the Western United States — the Great Plains, the Southwest, and California — including the geographical and cultural factors that have shaped their history.

Requirements for the Western American Studies minor are 20 units distributed as follows:

1. **HISA 137, HISA 138**
2. **One course from each of the following groups:**
   a) ETST 004/HIST 004, ETST 180/HISA 140, ETST 181/HISA 141, ETST 182/HISA 142, ETST 183/HISA 143
   b) ANTH 115E, ANTH 140F, ETST 110M
   c) ETST 108-I, ETST 108L, ETST 110K

History majors are not allowed to count HISA 137 or HISA 138 toward both their major and a minor in Western American Studies. If HISA 137 or HISA 138 is counted toward the major, then for the minor and additional course from (a) and an additional course from (b) are required.

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Women's Studies

(Please see Gender and Sexuality Studies)



Division of Undergraduate Education

Subject abbreviation: UGRD
Division of Undergraduate Education

Dr. Louie F. Rodriguez, Ed.D., Faculty Advisor
(951) 827-7942;

The Division of Undergraduate Education cultivates innovative opportunities for transformative student success. Through collaboration with our students, campus, and community, we remain at the forefront of innovation and creativity to enable students to reach their highest potential.

We aim to advance student success in alignmnet with our strategic goals including:

1) stregnthen student belonging

2) improve student satisfaction

3) boost involvement in high impact practices

4) increase graduation rates

5) reduce equity gaps

Lower-Division Courses

UGRC 198 R'courses : Variable Topics 1 Activity, 3 hours. Prerequisite(s): none; restricted to class level standing of sophomore, junior, or senior. Provides an opportunity to develop leadership skills, innovate the undergraduate curriculum, and promote a democratic, experiential education. Includes designing an original course topic that is variable and unique from other departmental course offerings. Highlights the student facilitators? expertise while working closely with a faculty mentor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content or topic changes to a maximum of 8 units.

UGRD 001 Foundations For Academic Advancement and Career Preparedness 2 Lecture, 2 hours. Prerequisite(s): none. Introduces career preparedness and provides practical strategies for career exploration and principles for networking-workforce success. Explores effective forms of written and professional communication.

UGRD 002 Foundations For Effective Oral Communication 2 Lecture, 2 hours. Introduces practical oral communication and public speaking skills that are necessary for networking, workforce success, and creating a professional profile.

UGRD 010 R Excellence: How Bold Hearts and Brilliant Minds Are Made 1 Lecture, 1 hour. Prerequisite(s): none. Offers an opportunity to appreciate the range of academic experiences provided at UCR. Includes presentations from faculty to provide opportunity to reflect on lessons learned.

UGRD 040 Contemporary Topics in Information and Society 2 Seminar, 2 hours. Prerequisite(s): none. Explores the impacts of information systems and legal and ethical issues surrounding information within a disciplinary or professional context. Introduces the principles of information literacy and provides preparation to find, evaluate, and integrate information in coursework, professional settings, and their lives. Course is repeatable as content or topic changes to a maximum of 4 units.

UGRD 105 Exploring Pathways to Graduate and Professional School 2 Lecture, 2 hours. Prerequisite(s): restricted to class level standing of junior, or senior. Focuses on long-term strategies and skills required to be successful in academic and professional pathways. Topics include writing application materials, a plan of action for applying for graduate and professional schools, and opportunities for collaboration to create sustainable career goals.

UGRD 106 Advanced Communication Skills For Academic and Personal Success 2 Lecture, 2 hours. Prerequisite(s): none; restricted to class level standing of junior, or senior. Focuses on advanced oral communication skills, specifically the ability to craft and present compelling and competitive personal oral narratives for graduate school, research opportunities, or industry positions.

UGRD 198G Group Internship 1 to 12 Seminar, 1 hour; individual study, 1 to 3 hours; internship, 2 to 36 hours. Prerequisite(s): restricted to class level standing of sophomore, junior, or senior. On- or off-campus internship work in an industry, community organization, school district, or non-profit. Conducted under the joint direction of an on- or off-campus supervisor and a Division of Undergraduate Education faculty member. Course is repeatable to a maximum of 16 units.



University Writing Program

Subject abbreviation: WRIT
Division of Undergraduate Education

Dr. Wallace Cleaves, Ph.D., Associate Dean and Director
(951) 827-9316;

The University Writing Program offers courses that fulfill the UC Entry Level and UCR English writing requirements. These courses are designed to help students write effectively in other University courses and later in their professional lives. University writing demands the ability to read carefully, to analyze what is read, and to draw conclusions about those data for both general and expert audiences. These courses help students learn to write well, read closely, and speak formally in public.

Lower-Division Courses

WRIT 001 Foundations of Academic Discourse 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 001L; placement determined by the UCR Writing Placement Process (WPP). Introductory course designed for multilingual, first-generation, or other students needing intensive, multi-quarter support in academic discourse foundations in writing, reading, listening, and speaking. Focuses on reading comprehension; oral communication; sentence clarity; and academic composition, editing, and revising skills. Graded Satisfactory (S) or No Credit (NC).

WRIT 001L Foundations of Academic Discourse Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 001; placement into WRIT 001 by the University Writing Program's Writing Placement Process (WPP). Reinforces foundational understanding and applications of English grammar and idiomatic expression, critical reading, and listening practice. Sets a foundation of improvement in reading comprehension, oral communication, and sentence clarity. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 2 units.

WRIT 003 Fundamentals of Academic Discourse 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 003L; WRIT 001 with a grade of S or better; special permission required to take WRIT 003 if students don?t receive an S in WRIT 001 after two attempts; or placement determined by the UCR Writing Placement Process (WPP). Course designed for multilingual, first-generation, or other students needing support in academic discourse fundamentals. Focuses on increasing communicative competence in composing a variety of texts with special attention to the writing process, academic grammar, critical reading, and verbal skills. Graded Satisfactory (S) or No Credit (NC).

WRIT 003L Fundamentals of Academic Discourse Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 003; WRIT 001 with a grade of S or better; or placement into WRIT 003 by the University Writing Program's Writing Placement Process (WPP). Reinforces fundamental understanding and applications of English grammar and idiomatic expression, critical reading, and listening practice. Sets a foundation of improvement in reading comprehension, oral communication, and sentence clarity. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 2 units.

WRIT 005 Frameworks of Academic Discourse 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 005L; WRIT 003 with a grade of S or better; special permission required to take WRIT 005 if students don't receive an S in WRIT 003 after two attempts; OR Placement determined by the UCR Writing Placement Process (WPP) OR UWP Director approval. Designed for multilingual, first-generation, or other students needing focused additional support honing academic communication skills. Advances student academic discourse skills through the combined frameworks of aural, oral, and written communications; process-based composition strategies; advanced reading comprehension strategies for a variety of subjects; and rhetorical grammar. Graded Satisfactory (S) or No Credit (NC).

WRIT 005L Frameworks of Academic Discourse Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 005; WRIT 003 with a grade of S or better; or placement into WRIT 005 by the University Writing Program's Writing Placement Process (WPP). Reinforces principles and applications of English grammar and idiomatic expression, critical reading, and rhetorical practice. Advances student academic discourse skills through process-based composition strategies, reading comprehension strategies for a variety of subjects, and rhetorical grammar. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units.

WRIT 007 English Writing For Academic Inquiry and Exchange of Ideas 4 Lecture, 3 hours; extra reading, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 007L; WRIT 005 with a grade of S or better; special permission required to take WRIT 007 if students don?t receive an S in WRIT 005 before the final academic quarter in the UC Entry-Level Writing Requirement time limit or UWP Director approval; placement determined by the UCR Writing Placement Process (WPP). Helps develop reading and writing proficiency in a rigorous, process-oriented approach. Introduces writing conventions of academic communities. Provides the opportunity to write response-oriented essays and refine the mechanics of their writing. Grade of 'C' or better satisfies the UC ELWR.

WRIT 007L English Writing For Academic Inquiry and Exchange of Ideas Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 007; WRIT 005 with a grade of S or better; or placement into WRIT 007 by the University Writing Program's Writing Placement Process (WPP). Focuses on mastery of principles and applications of academic language and idiomatic expression as well as critical reading. For students who do not need, or have advanced beyond, second-language instruction. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units.

WRIT 008 English Writing For Ideas in Conflict 4 Lecture, 3 hours; written work, 3 hours; tutorial, 0.5 hour. Prerequisite(s): concurrent enrollment in WRIT 008L; must be invited by the Director of the UWP based on the UCR Writing Placement Process (WPP). Examines academic argument in significant written texts with a consideration of spoken texts. Includes reading with attention to tone, rhetoric, and evidence; writing effective and persuasive essays; writing and delivering speeches; and delivering multimodal presentations. Passing students satisfy UC ELWR and are eligible for WRIT 010 or WRIT 010S.

WRIT 008L English Writing For Ideas in Conflict Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 008; placement into WRIT 008 by the University Writing Program's Writing Placement Process (WPP). Focuses on mastery of principles and applications of academic language, rhetoric, and intensive critical reading with attention to tone, rhetoric, and evidence. Includes writing effective and persuasive essays, writing and delivering speeches, and delivering multimodal presentations. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units.

WRIT 009 Academic Writing: Intensive 4 Lecture, 3 hours; tutorial, 0.5 hour; written work, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 009L; must be invited by the Director of the UWP based on the UCR Writing Placement Process (WPP). Introduces strategies of personal writing by fostering awareness of writing and reading, encouraging the consideration of audience and conventions of genre in smaller class environments with an embedded tutor. Considers responses to different rhetorical situations. Passing students satisfy UC ELWR and are eligible for WRIT 020 or WRIT 020S. Credit is awarded for one of the following WRIT 009, WRIT 010, or WRIT 010S.

WRIT 009L Academic Writing: Intensive Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in WRIT 009; must be invited by the Director of the UWP to WRIT 009 based on the UCR Writing Placement Process (WPP). Focuses on mastery of principles and applications of academic language and idiomatic expression, as well as critical reading, narrative structures, and initial argumentation fundamentals, for students who do not need, or have advanced

beyond, second-language instruction. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units.

WRIT 010 Academic Writing 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): WRIT 007 with a grade of C or better or WRIT 008 with a grade of C or better; fulfillment of the University of California Entry-Level Writing Requirement. Introduces strategies of personal writing to foster awareness as a writer and reader. Encourages consideration of audience and genre conventions, responses to different rhetorical situations, and incorporation of various forms of research when engaging with academic writing that employs individual voice and style. Credit is awarded for one of the following WRIT 010, WRIT 009, or WRIT 010S.

WRIT 010S Academic Writing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): WRIT 007 with a grade of C or better or WRIT 008 with a grade of C or better; fulfillment of the University of California Entry-Level Writing Requirement. Introduces strategies of personal writing to foster awareness as a writer and reader. Encourages consideration of audience and genre conventions, responses to different rhetorical situations, and incorporation of various forms of research when engaging with academic writing that employs individual voice and style. Credit is awarded for one of the following WRIT 010S, WRIT 009, or WRIT 010.

WRIT 020 Persuasive Writing 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): WRIT 010 with a grade of C or better or WRIT 010S with a grade of C or better or WRIT 009 with a grade of C or better. Emphasizes the transition from personal to public writing as students learn to apply the essential tenets of the rhetorical tradition of persuasion to various genres and develop arguments by identifying an issue, articulating a stance in relation to that issue, and defending that stance with appropriate evidence. Credit is awarded for one of the following WRIT 020 or WRIT 020S.

WRIT 020S Persuasive Writing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): WRIT 010 with a grade of C or better or WRIT 010S with a grade of C or better or WRIT 009 with a grade of C or better. Emphasizes the transition from personal to public writing as students learn to apply the essential tenets of the rhetorical tradition of persuasion to various genres and develop arguments by identifying an issue, articulating a stance in relation to that issue, and defending that stance with appropriate evidence. Credit is awarded for one of the following WRIT 020S or WRIT 020.

WRIT 030 Analytical Writing 4 Lecture, 3 hours; written work, 3 hours. Prerequisite(s): WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Addresses the function of writing in a range of contemporary situations from a critical and theoretical perspective. Includes analyzing and responding to a wide variety of texts to understand theoretical and critical models and to apply those models to texts to articulate an interpretative understanding. Credit is awarded for one of the following WRIT 030 or WRIT 030S.

WRIT 030S Analytical Writing 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Addresses the function of writing in a range of contemporary situations from a critical and theoretical perspective. Includes analyzing and responding to a wide variety of texts to understand theoretical and critical models and applying those models to texts to articulate an interpretative understanding. Credit is awarded for one of the following WRIT 030S or WRIT 030.

WRIT 040 (E-Z) Writing Across the Curriculum Workshops 0.5 Workshop, 0.5 hour. Focuses on exploring and practicing strategies for writing assignments in Writing Across the Curriculum courses. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC). Course is repeatable as content or topic changes to a maximum of 2 units.

WRIT 040F Writing Workshop in Phil 003w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in PHIL 003W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in PHIL 003W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040G Writing Workshop in Posc 005w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in POSC 005W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in POSC 005W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040I Writing Workshop in Pos C007w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in POSC 007W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in POSC 007W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040J Writing Workshop in Posc 010w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in POSC 010W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in POSC 010W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040K Writing Workshop in Dnce 007w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in DNCE 007W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in DNCE 007W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040L Writing Workshop in Anth 100w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in ANTH 100W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in ANTH 100W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040M Writing Workshop in Educ 103w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in EDUC 103W; WRIT 020 with a grade of C or better or WRIT 020S. Focuses on exploring and practicing strategies for writing assignments in EDUC 103W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040N Writing Workshop in Hist 020w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in HIST 020W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in HIST 020W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040O Writing Workshop in Hist 099w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in HIST 099W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in HIST 099W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040P Writing Workshop in Entm 060w & Bpsc 060w 0.5 Workshop, 0.5 hour. Prerequisite(s): ENTM 060W, may be taken concurrently or BPSC 060W, may be taken concurrently; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in cross-listed course ENTM 060W and BPSC 060W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040Q Writing Workshop in Engr 180w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in ENGR 180W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in ENGR 180W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040R Writing Workshop in Engr 181w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in ENGR 181W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in ENGR 181W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040S Writing Workshop in Phys 142w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in PHYS 142W; WRIT 020 with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in PHYS 142W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040T Writing Workshop in Anth 001w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in ANTH 001W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in ANTH 001W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040U Writing Workshop in Cplt 001w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in CPLT 001W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in CPLT 001W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040V Writing Workshop in Lbst 020w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in LBST 020W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in LBST 020W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040X Writing Workshop in Hnpg 002w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in HNPG 002W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in HNPG 002W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 040Y Writing Workshop in Anth 141w 0.5 Workshop, 0.5 hour. Prerequisite(s): concurrent enrollment in ANTH 141W; WRIT 020 with a grade of C or better or WRIT 020S with a grade of C or better. Focuses on exploring and practicing strategies for writing assignments in ANTH 141W. Includes a close reading of prompts, forming relevant theses, finding and organizing evidence, and demonstrating analytical and critical thinking. Graded Satisfactory (S) or No Credit (NC).

WRIT 055 Oral Communication 4 Discussion, 3 hours; activity, 3 hours. Prerequisite(s): none. An introduction to public speaking in genres and for occasions appropriate in the academy and in public forums. Covers classroom and seminar presentations, conference presentations including poster talks and speeches appropriate for public assemblies, debate, and special occasions. Offered in Summer only.

WRIT 301 Introduction to the Teaching of Writing 1 Lecture, 1 hour. Prerequisite(s): limited to University Writing Program Teaching Assistants; graduate standing. A flexible program of meetings and workshops specifically devoted to orienting Teaching Assistants to the Writing Program at UC Riverside. Concentrates on organizing and teaching WRIT 010, WRIT 020, WRIT 030, or its equivalent. Graded Satisfactory (S) or No Credit (NC).

WRIT 302 Teaching Practicum 2 Seminar, 1 hour; practicum, 3 hours. Prerequisite(s): limited to Writing Program ASEs; graduate standing. A flexible program of meetings and workshops specifically devoted to the techniques of instruction most pertinent to entry-level and first-year Writing courses. Required of all University Writing Program Teaching Assistants when teaching a writing course for the first time. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.



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Sr. Director, Foundation Development ..... **Cassie H. Riger**
Sr. Director, Housing Services ..... **Robert S. Brumbaugh**
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Sr. Director, Policy & Strategic Initiatives ..... **Mary E. White**
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Sr. Director, Regional & Pipeline Development ..... **Dolores I. Ybarra**
University Registrar ..... **Bracken Janette Dailey, M.S.**
Director, Academic Personnel Policy & Employee Relations ..... **Esperanza I. Steward**
Director, Academic Personnel Data & Technology ..... **Sara Umali**
Director, Academic Resource Center ..... **Rena M. Roberts , Ed.D.**
Director, Academic Technology/Teaching and Learning Initiatives ..... **Israel Fletes**
Director, Administration, Summer Sessions ..... **Leonard B. Taylor, M.F.A.**
Director, Alumni Marketing Strategy & Analytics ..... **Dalyn R. Montgomery**
Director, Alumni Programming and Career Development ..... **Brock Cavett**
Director, Alumni Volunteer Engagement (Bus., Engr., Sci., & Med.) ..... **Deana L. Mesa**
Director, Alumni Volunteer Engagement (Chapters, Networks, & Affinities) ..... **Tracy L. Telliard**
Director, Annual Giving ..... **Marianne E. Paek**
Director, Audit and Advisory Services ..... **Greg Moore, C.P.A.**
Director, Benefits, Health & Wellness ..... **Demetrius A. Patrick**
Director, Compensation and Benefits ..... **Vacant**
Director, Constituent Management & Technologies ..... **Dr. Mai Vang**
Director, Development (Athletics) ..... **Malaki Roy**
Director, Development (School of Medicine) ..... **Jane Hoag**
Director, Culinary Operations & Executive Chef ..... **Lanette D. Dickerson**
Director, Digital Marketing and Analytics ..... **Kelly McGrail, B.S.**
Director, Emergency Management ..... **Andrew Flores**
Director, Employee and Labor Relations ..... **Vacant**
Director, Employee & Organizational Development Programs ..... **Alexandra M. Rollins**
Director, Enrollment Marketing ..... **Luis Bravo**
Director, Federal Relations ..... **Kathleen Eiler**
Director, Financial and Adminstrative Services Team (FAST) ..... **Elizabeth Tatum**
Director, Pre-Professional Advising Center ..... **Charles P. Scruggs**
Director, HR Information Systems ..... **Vacant**
Director, HUB Operations ..... **Geovanny Perez**
Director, Human Resources & Executive Searches ..... **Tanya N. Adams**
Director, Human Resources & HRBP ..... **Sue Tintorer**
Director, Parent and Student Engagement ..... **Chelsea Usher**
Director, Project Management ..... **Drew A. Hecht**
Director, Prospect Development ..... **Kimberley J. Harvie**
Director, Regional and Pipeline Development ..... **Tim McPheron**
Director, Regional and Pipeline Development ..... **Christina Robles**
Director, Regional Development, San Diego & Orange Counties ..... **Brittany L. Wray**
Director, Residential Dining ..... **Cedric Martin**
Director, Retail & Restaurants ..... **Kurt Duffner**
Director, Strategic Initiatives (School of Medicine) ..... **Vladimir Oge, M.P.H.**
Director, Student Affairs SAPEP ..... **Frances M. Calvin**
Director, Student Engagement (Undergraduate Education) ..... **Gladis Herrera-Berkowitz**
Director, Training & Education ..... **Janette de la Rosa Ducut**
Director, TRiO ..... **Álbaro Martín**
Director, TRiO Scholars ..... **Daisy A. Rodriguez**
Director, UCR College Corps ..... **Jessica Marie Saldivar**
Director, UCR Retirement Center ..... **Cristina L. Otegui**
Director, Undergraduate Admissions ..... **Veronica Zendejas**
Director, Video and Photography ..... **Omar Gonzalez**
Interim Director, Talent Acquisition & Diversity Outreach ..... **Deborah Page**
Director, University Events ..... **Jill Barber**

Chief Campus Officers

Provost, 1949–56 ..... **Gordon S. Watkins**
Provost, 1956–58; Chancellor, 1958–64 ..... **Herman Spieth**
Chancellor, 1964–1979 ..... **Ivan Hinderaker**
Chancellor, 1979–1984 ..... **Tomás Rivera**
Acting Chancellor, 1984–1985 ..... **Daniel G. Aldrich, Jr.**
Chancellor, 1985–1987 ..... **Theodore L. Hullar**
Chancellor, 1987–1992 ..... **Rosemary S.J. Schraer**
Chancellor, 1992–2002 ..... **Raymond L. Orbach**
Acting Chancellor, 2002 ..... **David H. Warren**
Chancellor, 2002–2007 ..... **France A. Córdova**
Acting Chancellor, 2007–2008 ..... **Robert D. Grey**
Chancellor, 2008–2012 ..... **Timothy P. White**
Acting Chancellor, 2012–2013 ..... **Jane C. Conoley**
Chancellor, 2013–2025 ..... **Kim A. Wilcox**

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