



Academic Departments and Programs

Biological Science

College of Natural Sciences and Mathematics

ACTING DEPARTMENT CHAIR

Kathryn Dickson

DEPARTMENT OFFICE/WEBSITE

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<http://biology.fullerton.edu>

PROGRAMS OFFERED

Bachelor of Science in Biological Science with Concentrations in:
Cell and Developmental Biology
Ecology and Evolutionary Biology
Marine Biology
Molecular Biology and Biotechnology
Minor in Biotechnology
Minor in Cell and Molecular Biology
Minor in Environmental Biology
Master of Biotechnology
Master of Science in Biology
Subject Matter Preparation Program for Single Subject Teaching Credential

FACULTY

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INTRODUCTION

Biology is the branch of science concerned with the study of life. The discipline is dynamic, diverse and expanding with the integration of new molecular approaches, information technology and concerns for the environment. Through the study of biology students will: learn principles that govern the function of their own body and those of other organisms; explore how complex organisms develop from a single cell and how genes and the environment govern these events; and learn how plants capture the energy from the sun and, ultimately, sustain almost all life on Earth through intricate relationships with other organisms, including humans. In addition, in Southern California, proximity to a variety of employers ranging from biotechnology and biomedical companies, to environmental consulting firms provides biology majors with diverse employment opportunities.

The department has designed a curriculum that builds on a core of biology and supporting courses for students who: (1) seek careers in industry and state or federal agencies, (2) wish to prepare for secondary school teaching, or (3) desire to enter graduate and professional schools. The curriculum beyond the basic core experience will be developed through individual advising. Students will be assigned a faculty adviser when they enter the university or they may choose a faculty member to serve as their adviser. Each semester, students are required to meet with their designated adviser in order to develop an appropriate program of study. After discussion with their adviser, students will elect upper-division courses in one of four concentrations that will satisfy their individual interests and professional goals.

LEARNING GOALS AND STUDENT LEARNING OUTCOMES

Bachelor of Science in Biological Science

The following goals and learning outcomes have been established for students pursuing a Bachelor of Science in Biological Science:

Content Knowledge

- Explain (i.e., expound, explicate, elucidate, and interpret) fundamental concepts and principles in the following areas of biological knowledge: biodiversity, cell biology, developmental biology, ecology, evolution, genetics, molecular biology, organismal biology, and physiology
- Interpret the following unifying themes in the context of the above areas of biological knowledge: complexity of biological systems, cycles, feedback loops, energy flow, homeostasis, information flow, networks, and structure-function relationships
- Demonstrate specialization and thus be able to explain advanced concepts in one or more of the areas of biological knowledge in the first bullet above
- Interpret connections between science and technology, past scientific discoveries and current scientific progress, academic requirements and careers or professional advancement, the scientific method including its limitations and the discovery of new knowledge, and bioethics/scientific integrity and the advancement of science

Skills

- Communication – Communicate effectively orally; communicate effectively in writing; write in scientific format acceptable by scientific journals
- Teamwork – Work cooperatively to solve problems in a group of diverse composition
- Finding biological information – Find, evaluate, use, and integrate published information; use databases and information technology
- Critical thinking and problem-solving – Make an argument and support it; recognize and use deductive and inductive reasoning; integrate concepts within and among disciplines; recognize patterns; identify unifying principles; solve problems; distinguish between data and inferences based on data; distinguish information from scientific versus pseudo- and non-scientific sources and methods
- Use of the scientific method – Use deductive methods of inquiry; apply the scientific method to problems by generating hypotheses and designing experiments to test these hypotheses
- Analytical and quantitative skills – Create data sets from observations; objectively analyze data; interpret data; use quantitative methods for the analysis of data
- Lab and field work – Use appropriate technology; use equipment properly; follow safety procedures; apply government regulations

Attitudes

- Embrace lifelong learning by being capable of self-directed learning; having a continual interest in biology; having confidence in one's knowledge, skills, and abilities
- Value learning by being open-minded; appreciating the value of knowledge; appreciating and respecting alternative possibilities and explanations; experiencing the joy of discovery
- Demonstrate knowledge of careers by defining potential career paths; being aware of the requirements for career or professional advancement
- Be aware of impacts of biological issues on society by valuing the support of science by society; appreciating the relevance of biology to society; recognizing the connectedness of science, society, and history
- Demonstrate an awareness of bioethics by identifying and evaluating ethical issues in biology; appreciating the value of integrity; valuing ethical behavior
- Demonstrate appropriate stewardship and advocacy by respecting biodiversity; contributing to the understanding of true science; helping the public make informed decisions; being responsible stewards of biological resources
- Demonstrate biological literacy by distinguishing science from pseudoscience; recognizing that science is a way of viewing the world and is not just a collection of facts; understanding the

limitations of science; applying scientific thinking to everyday problems; recognizing the impermanence of “truths”

All students will progress through lower-division core courses and select an upper-division concentration. Details of learning goals for the core and concentrations may be found at biology.fullerton.edu.

Master of Biotechnology (MBt)

The following goals and learning outcomes have been established for students pursuing a Master of Biotechnology (MBt):

Content Knowledge

- Demonstrate knowledge in a primary area of expertise
- Identify and critically evaluate the literature in the primary area
- Understand the basic processes of product life cycles

Information Literacy Skills

- Determine what kind of information is needed to solve a problem
- Identify how to obtain the relevant information from literature/information databases
- Critically assess the information for its rigor
- Cite the information gathered appropriately in written and oral formats

Communications Skills

- Work effectively as a member of an interdisciplinary team
- Converse with colleagues in all disciplines related to the mission of PABS
- Write and present project proposals and technical reports that communicate effectively with all levels of an organization
- Communicate effectively with individuals at governmental and public entities

Applications

- Demonstrate mastery of basic application skills in biotechnology disciplines
- Develop experimental or practical designs for solving problems in product or process development
- Analyze the driving forces for product development
- Use knowledge effectively in new situations and diverse contexts

Biotechnology Industry

- Demonstrate knowledge of commercialization of biotechnology in pharmaceuticals, biomedical devices, diagnostics/assays systems, clinical trial management, and related companies
- Understand the essential processes of project management
- Understand the essential processes of regulatory affairs and clinical trials management

Master's of Science in Biology

The following goals and learning outcomes have been established for students pursuing a Master of Science in Biology:

Content Knowledge

- Demonstrate knowledge in a primary area of expertise and place the thesis research in the context of the current state of knowledge of the field
- Critically evaluate the primary and secondary literature in a primary area of expertise
- Gain an appreciation for the diversity and multidisciplinary nature of biological science through participation in workshops, seminars and small working groups

Information Literacy Skills

- Use library and electronic resources to obtain virtually all of the literature sources published in a primary area of expertise in biology
- Cite the information gathered appropriately in written and oral formats

Scientific Research Skills

- Work independently to conduct and complete original research
- Demonstrate mastery of research approaches and techniques appropriate to a primary area of expertise
- Demonstrate mastery of key elements of research and study design and apply them to an independent research project
- Analyze and interpret data appropriately and present results properly in written, tabular and graphical formats

Communication Skills

- Write a thesis proposal that contains the key elements of a competitive grant proposal
- Prepare and give high-quality, professional presentations (oral and poster) about the results of independent research
- Write a scholarly thesis containing key elements of a published article in one's primary area of expertise

Special Programs

In addition to the usual course offerings, the Department of Biological Science participates in the Center for Applied Biotechnology Studies and four consortial programs with other California State University campuses. These are: CSUPERB (California State University Program for Education and Research in Biotechnology); the CSU Council on Ocean Affairs, Science & Technology (COAST); the Ocean Studies Institute (through the Southern California Marine Institute); and the California Desert Studies Consortium at Soda Springs. Each of these centers is described in this catalog under "Research Centers."

Single Subject Teaching Credential Information

The Bachelor's Degree in Biology may be effectively combined with subject matter studies necessary for the Single Subject Teaching Credential in Biological Sciences. Contact the Center for Careers in Teaching (657-278-7130, www.fullerton.edu/cct) and the Science Education Programs Office (657-278-2307, <http://nsm.fullerton.edu/scied/>) for early advisement and to plan efficient course selections for general education, the major and credential program coursework. Additional information is found under Science Education Programs in the University Catalog, as well as at <http://mast.wikispaces.com>.

Recommendations for Transfer Students

Students planning to transfer from another college or university should take biology, chemistry, mathematics and/or physics courses that are equivalent to those required for the B.S. in Biological Science (refer to www.assist.org). Prospective transfer students should contact the Biology Department as soon as possible prior to transfer to select appropriate courses.

Upper-Division Baccalaureate Writing Requirement

To meet the upper-division baccalaureate writing requirement, students must: (1) pass the English Writing Proficiency exam; and (2) pass with a "C" (2.0) or better ENGL 301 or six units from the following: BIOL 411, 414, 417, 422, 426, 445, 446, 447, 449, 468, 470, 495, 498.

BACHELOR OF SCIENCE IN BIOLOGICAL SCIENCE (120 UNITS)

The Bachelor of Science in Biological Science requires 43 units in the major, 33-34 units of supporting courses in physical sciences and mathematics and an exit exam on biology in the spring semester of the senior year. All courses must be passed with a "C" (2.0) or better. Those seeking careers in the health professions should speak to a health professions adviser about specific course recommendations. For more information, visit: http://www.fullerton.edu/health_professions/.

Core Requirements for the Major (20 units)

- BIOL 171 Evolution and Biodiversity (5)
- BIOL 172 Cellular Basis of Life (5)
- BIOL 273 Genetics and Molecular Biology (5)
- BIOL 274 Principles of Physiology and Ecology (5)

Upper-Division Courses (23 units)

(Choose from four concentrations)

The upper-division program is designed to provide students with depth in a chosen concentration. The upper-division program requires at least five units of laboratory- or field-based activities, six units of 400-level biology courses and two units of a specified capstone course.

Students with junior or senior standing will be permitted to enroll in BIOL 480, 482, 495, 498 and 499L. However, no more than a combined total of six units of BIOL 480 (2 units max), 482 (2 units max), 495 (3 units max), 498 (2 units max) and 499L

(6 units max) shall be counted toward the 23 upper-division biology units required for the major, and no more than three of these units may count toward the requirement to complete at least five units of upper-division biology laboratory/field electives.

Supporting Course Requirements for the Major (29-30 units)

CHEM, 301A,B, 302; or 302A,B

PHYS 211, 211L, 212, 212L

MATH 130 or 150A AND 150B, 337 or 338

CONCENTRATION IN ECOLOGY AND EVOLUTIONARY BIOLOGY (23 UNITS)

Required Upper-Division Courses (6 units)

BIOL 314 Population and Community Ecology (3)

BIOL 325 Principles of Evolution (3)

Upper-Division Electives (6 units minimum)

One course from each category:

Organismal Courses (3 units)

BIOL 302, 340, 344, 441, 467, 474, 476, 478, 479

Physiology Courses (3 units)

BIOL 362, 444, 445*, 465, 468*

Additional Upper-Division Electives (5 units minimum)

Any additional upper-division biology courses from the Organismal Biology or Capstone list (additional units from Organismal Biology or Capstone courses not used to fulfill those requirements count here) or courses from the following: BIOL 301, 317¹, 402, 404 or 409, 419¹, 419L¹, 422^{1*}, 436, 442, 443, 446^{1*}, 449*, 461¹, 466, 475¹

Free Upper-Division Biology Electives

Although it is recommended that Ecology and Evolutionary Biology Concentration majors select additional elective units from courses listed under Upper-Division Electives and Additional Upper-Division Electives under this concentration, any upper-division biology majors course may be utilized to complete the concentration's 23-unit requirement.

Capstone Courses (2 units minimum)

BIOL 400, 401, 447*, 450, 465*, 481, 482, 495*, 498*, 499L

¹ a maximum of 4 units of these marine biology classes may be applied toward the 23 upper-division electives required for the BEC concentration

* courses that meet the upper-division writing requirement (6 units required)

CONCENTRATION IN CELL AND DEVELOPMENTAL BIOLOGY (23 UNITS)

At least five units must be laboratory- or field-based activities, and at least six units must be 400-level biology courses.

Required Upper-Division Courses (7 units)

BIOL 302 General Microbiology (4)

BIOL 303 Intermediate Cell Biology (3)

Upper-Division Biology Electives (10 units minimum)

Cell Biology Courses (7 units minimum)

BIOL 362, 405, 417*, 418L, 424, 426^{2*}, 428², 429², 430, 465*, 470^{2*}

Associated Courses

One of the following may be used to complete the 10-unit minimum:

BIOL 309, 402, 407, 411*, 412, 413, 414*, 430, 445*, 448

CHEM 421 OR 423A

Free Upper-Division Biology Electives

Although it is recommended that Cell and Developmental Biology Concentration majors select additional elective units from courses listed under Upper-Division Biology Electives under this concentration, any upper-division biology majors course may be utilized to complete the concentration's 23-unit requirement.

Capstone Courses (2 units minimum)

BIOL 400, 426^{2*}, 428², 429², 465^{2*}, 470^{2*}, 482, 495*, 498*, 499L

² courses that count as either electives or capstone, but not both.

* courses that meet the upper-division writing requirement (6 units required)

CONCENTRATION IN MARINE BIOLOGY (23 UNITS)

Required Upper-Division Courses (3 units)

BIOL 314 Population and Community Ecology (3)

OR BIOL 325 Principles of Evolution (3)

Upper-Division Electives (11 units minimum)

Ecology Courses (4 units minimum)

BIOL 419 and 419L

OR BIOL 422*

Organismal/Systematics Courses (4 units minimum)

BIOL 446*, 461, 475

Other Marine Biology Courses (3 units minimum)

BIOL 301, 302, 317, 402, 404 or 409, 405, 436, 468*, or additional courses listed above

Free Upper-Division Biology Electives

Although it is recommended that Marine Biology majors select additional units from the courses listed under Upper-Division Biology Electives under this concentration, any upper-division biology majors course may be utilized to complete the concentration's 23-unit requirement.

Capstone Courses (2 units minimum)

BIOL 400, 401, 422*, 450, 482, 495*, 498*, 499L

Selected approved courses from the Ocean Studies Institute (see <http://scmi.us/category/ocean-studies-institute>) taken as part of the CSU Catalina Semester may be used to fulfill these requirements.

* courses that meet the upper-division writing requirement (6 units required)

CONCENTRATION IN MOLECULAR BIOLOGY AND BIOTECHNOLOGY (23 UNITS)

Required Upper-Division Courses (6-7 units)

BIOL 309 Intermediate Molecular Biology (3)

AND one or more of the following:

BIOL 302 General Microbiology (4)

CHEM 421 Biological Chemistry (3)

OR CHEM 423A General Biochemistry (3)

Upper-Division Biology Electives (10 units minimum)

Molecular Biology Courses (6 units minimum)

BIOL 402, 405, 407, 411*, 412, 413, 414*, 430, 445*, 448, 472A³, 472B³, 473

CHEM 421 OR 423A

Associated Courses

The following may be used to complete the 10-unit minimum;

BIOL 362, 417, 418L, 424, 426*, 428, 429³, 444, 465*, 470*, 477

Free Upper-Division Biology Electives

Although it is recommended that Molecular Biology and Biotechnology Concentration majors select additional elective units from courses listed under Upper-Division Biology Electives under this concentration, any upper-division biology majors courses may be utilized to complete the concentration's 23-unit requirement

Capstone Courses (2 units minimum)

BIOL 400, 412, 429³, 430, 472A³, 472B³, 482, 495*, 498*, 499L

³ courses that count as either electives or capstone but not both.

* courses that meet the upper-division writing requirement (6 units required)

MINOR IN BIOTECHNOLOGY (31 UNITS)

The biotechnology minor is appropriate for students majoring in biological science or biochemistry and interested in gaining employment in nearly any area of the growing medical and agricultural biotechnology industries, working in academic research laboratories, or pursuing postgraduate degrees in basic molecular biology or biochemistry.

The biotechnology minor requires chemistry and biology courses that must be completed with a minimal overall grade-point average of 2.0 and include 12 units unique to the minor that are not used to meet requirements for the biological science or biochemistry major.

Required Core Courses (28 units)

BIOL 273 Genetics and Molecular Biology (5)

BIOL 309 Intermediate Molecular Biology (3)

OR CHEM 421 Biological Chemistry (3)

CHEM 301A,B Organic Chemistry (6)

CHEM 302 or CHEM 302A,B Organic Chemistry Laboratory (2)

BIOL 412 Principles of Gene Manipulation (3)

BIOL/CHEM 472A,B Advances in Biotechnology Laboratory (6)

CHEM/BIOL 477 Advances in Biotechnology (3)

Supporting Courses (3-4 units)

One of the following:

BIOL 309, 413, 424

CHEM 421, 423A, 423B

MINOR IN CELL AND DEVELOPMENTAL BIOLOGY (26 UNITS)

Science has become increasingly interdisciplinary with biophysics, biochemistry, bioengineering, psychology and kinesiology as examples of disciplines that rely heavily on knowledge of biological science in the area of cell and molecular biology. Students majoring in these disciplines will be more competent and more competitive for graduate programs of employment with evidence of a minor that requires extensive education in cell and molecular biology. All courses must be passed with a grade of "C" (2.0) or better.

Lower-Division Core (10 units)

BIOL 172 Cellular Basis of Life (5)

BIOL 273 Genetics and Molecular Biology (5)

Upper-Division Required Courses (6 units)

BIOL 303 Intermediate Cell Biology (3)

BIOL 309 Intermediate Molecular Biology (3)

Upper-Division Cell and Molecular Courses

(10 units, including at least 1 unit of laboratory and 6 units of 400-level courses)

BIOL 302, 362, 402, 405, 411, 412, 413, 414, 417, 418L, 424, 426, 428, 429, 445, 448, 470

CHEM 421

MINOR IN ENVIRONMENTAL BIOLOGY (22 UNITS)

Understanding and controlling our environment has become an important career path in the 21st century. Understanding the biological science relevant to studying the environment is needed for students majoring in other disciplines to be more competitive for entry into graduate programs or into the work force. The minor will also provide students planning careers in secondary education science teaching with an expanded knowledge of environment-related issues. All courses must be passed with a grade of "C" (2.0) or better.

Lower-Division Core (10 units)

BIOL 171 Evolution and Biodiversity (5)

BIOL 274 Physiology and Ecology (5)

Upper-Division Required Course (3 units)

BIOL 314 Population and Community Ecology (3)

Upper-Division Ecology Course (3 units)

BIOL 419 & 419L, 422, 443, 444, 449, 466

Upper-Division Elective (3 units)

BIOL 317, 325, 340, 401, 441, 446, 447, 450, 461, 467, 475, 476

At least one upper-division biology laboratory course from the list above must be completed.

Related Courses (3 units maximum)

CHEM 313A, 313B, 313C, 436, 437, 448

ECON 362

GEOG 323, 450, 481

GEOL 333, 335, 380

HESC 415

PHIL 313

MASTER OF BIOTECHNOLOGY PROGRAM FOR APPLIED BIOTECHNOLOGY STUDIES (40 UNITS)

The PABS Master of Biotechnology (MBt) is a Professional Science Master's Program that prepares graduates for careers in biomedical device, pharmaceutical and biopharmaceutical industries. The two-year program provides training in the science and skills fundamental to industry, including knowledge of molecular and cellular biology, mathematical modeling, biological database mining and relevant technology. Students receive instruction in regulatory affairs, project management, cross-functional teamwork, communication and group leadership skills. They also participate in an industry-based fellowship, complete an industry-related project, and specialize in one of six concentrations: Medical Devices, Regulatory Affairs/Quality Assurance/Clinical Trials, Molecular Biology/Biochemistry, Informatics/Biomathematics, Biotechnology Business or Analytical Chemistry.

The PABS MBt degree is a collaborative effort of three CSU campuses: Fullerton, Los Angeles and Pomona. Each campus will offer at least one required course, as well as advanced elective courses.

Admission Requirements

Students must submit two applications; one each to the university and the department. Applicants must meet the university requirements for admission, including a baccalaureate from a four-year (or equivalent), regionally accredited institution and at least a 2.5 grade-point average (GPA) in the last 60 semester units attempted (see section of this catalog on Graduate Admissions for complete statement and procedures). In addition, acceptance into this program is contingent upon the following: (1) a B.A. or B.S. from an accredited institution with a 3.0 GPA in major courses in biological science or related area, engineering or related area, chemistry or related area, business or related area, or mathematics or related area; (2) submitting scores from the Graduate Record Examination General Test, Medical College Admission Test, Dental Admission Test or Graduate Management Admission Test; (3) completing the departmental application; and (4) submitting two letters of recommendation from faculty members. Students with deficiencies may be considered for conditional acceptance into the program. For conditionally accepted students, the specific conditions and a deadline for their completion are determined at the time of admission; continuation in the master's program is dependent upon completing the admission conditions by the specified deadline.

MASTER OF SCIENCE IN BIOLOGY (30 UNITS)

The M.S. in Biology is a thesis-based degree for which the student completes original, independent research in one of the following areas: Cell and Developmental Biology, Ecology and Evolutionary Biology, Marine Biology, Molecular Biology and Biotechnology, or Biology Pedagogy Research.

Admission Requirements

Students must submit two applications, one each to the university and the department. Applicants must meet the university requirements for admission, including a baccalaureate from a four-year (or equivalent), regionally accredited institution and at least a 2.5 GPA in the last 60 semester units attempted (see section of this catalog on Graduate Admissions for complete statement and procedures). In addition to the university requirements for admission, acceptance into this program is contingent upon the following: (1) a B.A. or B.S. in Biological Science or related area at an accredited institution with a 3.0 GPA in biology courses and 2.5 GPA in the related courses in mathematics, chemistry and physics; (2) submitting scores on from the Graduate Record Examination General Test, Medical College Admission Test or Dental Admission Test; (3) completing the departmental application; (4) submitting two letters of recommendation; and (5) acceptance by a thesis adviser.

Students with deficiencies may be considered for conditional acceptance into the program. For conditionally accepted students, the specific conditions and a deadline for their completion are determined at the time of admission; continuation in the M.S. program is dependent upon completion of the admission conditions by the specified deadline.

Application Deadlines

Departmental applications are accepted from Nov. 1 to April 30 for fall admissions and from May 1 to Oct. 31 for spring admissions. A completed departmental application and all required documents must be received by these deadlines. Check the Department of Biological Science website for information at <http://biology.fullerton.edu>.

Classified Standing

Students should achieve classified graduate standing as soon as they are eligible, because no more than nine units of graduate work taken before classification can be included on the study plan (see below) for the degree. A student who meets the admission requirements may apply for classified standing, which requires the development of a study plan approved by the thesis adviser, thesis committee, Department Graduate Program Adviser and Associate Vice President of Graduate Studies and Research. Students admitted with conditional acceptance must meet conditions (see above) before being considered for classified standing.

Advancement to Candidacy

Advancement to candidacy is attained by requesting a graduation check and receiving subsequent approval of the Department Graduate Program Adviser and Associate Vice President of Graduate Studies and Research.

Study Plan

Students must meet the Graduate Level Writing Requirement, which is described in this catalog under "Graduate Regulations." Biology M.S. candidates will meet this requirement by passing BIOL 500A,B.

At least one-half of the study plan's total units must be at the 500 level. All study plans must include BIOL 500A,B, 580D, 598, 599 and at least two graduate seminars.

A thesis acceptable to the adviser and committee, covering a research problem, as well as a thesis defense and a public presentation on the thesis research, are required to complete the degree program.

Supervising the work of graduate students requires the personal attention of advisers. To insure that advisers are available for new graduate students, a graduate student is expected to complete the requirements for graduation within three years after classification.

For more detailed information or advisement, students should contact the Department of Biological Science or the Department Graduate Program Adviser at biogradadv@fullerton.edu.

BIOLOGICAL SCIENCE COURSES

Courses are designated as BIOL in the class schedule.

Unless otherwise designated, prerequisites may be waived by the instructor of the course if the instructor is satisfied that the student is qualified for the course.

101 Elements of Biology (3)

Underlying principles governing life forms, processes and interactions. Elements of biology and reasoning skills for understanding scientific issues on personal, societal and global levels. For the non-science major. No credit toward biological science major. One or more sections offered online.

101H Elements of Biology (Honors) (3)

Corequisite: BIOL 101LH (Honors). Students must meet honors qualifications. Living organisms and characteristics of the natural environment. Scientific reasoning leading to our current understanding of living systems. For the non-science major.

101L Elements of Biology Laboratory (1)

Pre- or corequisite: BIOL 101. Laboratory experiments demonstrating the principles presented in the lecture course. Scientific inquiry, cell structure and function, physiology, genetics, biodiversity, evolution and ecology. For the non-science major. (3 hours laboratory or fieldwork; weekend field trips may be required)

101LH Elements of Biology Laboratory (Honors) (1)

Corequisite: BIOL 101H (Honors). Students must meet honors qualifications. Laboratory experiments and demonstrations which provide insight into scientific reasoning and the basis of our current understanding of living systems. For the non-science major. (3 hours laboratory or fieldwork; field trips may be required)

102 Biology for Future Teachers (3)

Designed especially for the prospective teacher, this activity-based course examines biological concepts in real-world contexts, such as the medical examination, genes and evolution, and the environment. Lecture and laboratory form a single unified learning experience. No credit toward biological science major. (6 hours activity)

171 Evolution and Biodiversity (5)

Prerequisite: must be eligible to take MATH 115 or higher and have passed/be eligible to take ENGL 101. Introduction to scientific processes and methods of biology. Unifying principles of evolution processes leading to biodiversity, and principles of conservation biology. (Primarily for majors in the Colleges of Natural Science/Mathematics and Engineering/Computer Science; 3 hours lecture, 6 hours laboratory/fieldwork; weekend field trips are required)

172 Cellular Basis of Life (5)

Prerequisite: Must be eligible to take MATH 115 or higher and have completed/be eligible to take ENGL 101; biology and biochemistry majors, BIOL 171 with a "C" (2.0) or better; biochemistry majors, must be eligible to take CHEM 120A. Structure and function of prokaryotic and eukaryotic cells including: evolutionary relationships; cell membranes; compartmentation; signaling and metabolic pathways; cellular reproduction; cell differentiation, multicellularity and development. (For majors in Colleges of Natural Science/Mathematics and Engineering/Computer Science; 3 hours lecture, 6 hours laboratory)

191A Integrated Human Anatomy and Physiology (4)

(Same as KNES 191A)

191B Integrated Human Anatomy and Physiology (4)

Prerequisite: KNES/ BIOL 191A; corequisite: CHEM

200. Second semester of integrated concepts in human anatomy and physiology for nursing, allied health, and kinesiology majors. Nutrition, water and ion balance, and homeostatic regulation by the digestive, renal, cardio-respiratory, endocrine, nervous systems. No credit toward biological science major. (3 hours lecture, 3 hours laboratory) (Same as KNES 191B)

202 Microbiology for Nursing and Allied Health Professionals (4)

Prerequisite: BIOL 101, 191A or equivalent; corequisite:

CHEM 100 (for non-nursing majors) or 200 (for nursing majors). Introduction to bacteria, fungi, protozoa and viruses with emphasis on pathogenic agents and how they are controlled by host defenses and human intervention. Laboratory provides practice with basic microbiological skills. No credit toward biological science major. (3 hours lecture, 3 hours laboratory)

210 Human Anatomy and Physiology (3)

Introductory anatomy and physiological concepts for Kinesiology and Health Science majors. Gross and micro-level human anatomy as well as the structure and function of selected systems. Preparation for KNES 260, 300, 348, 371, and the major in Health Science. No credit toward biological science major. (Same as KNES 210)

273 Genetics and Molecular Biology (5)

Prerequisite: BIOL 172 with a "C" (2.0) or better, and CHEM 120A with a "C" or better or concurrent enrollment in CHEM 120A. Underlying principles of inheritance, structure and functions of nucleic acids, regulation of gene expression, the mechanisms by which populations evolve, and the impact of biotechnology on society. (3 hours lecture, 6 hours laboratory)

274 Principles of Physiology and Ecology (5)

Prerequisites: BIOL 273 and CHEM 120A with a "C" (2.0) or better; MATH 130, 150A or 337 suggested. Principles of organisms' interactions with their environments; physiological and evolutionary mechanisms of change in response to environmental factors; population and community ecology; energy and material flow through ecosystems. (3 hours lecture, 6 hours laboratory/fieldwork; weekend field trips are required)

299L Directed Laboratory Study (1-3)

Prerequisites: BIOL 171, 172 and consent of instructor.

Research in biology under the supervision of a biology faculty member. Intended for students (especially lower division) who may not have completed sufficient coursework to allow them to work independently, but who are eager for laboratory research experience. May be repeated for university credit. (3 hours laboratory per unit)

300 Environmental Biology and Sustainability (3)

Prerequisite: BIOL 101. Biological consequences of human intervention in ecosystems: Endangered and threatened species, pollution impact on organisms, pest control, population dynamics, genetic engineering of agricultural species, management of natural areas and urban ecosystem dynamics. No credit toward biological science major. One or sections offered online.

301 Problems in Environmental Biology (3)

Prerequisite: admission into the Southern California Ecosystems Research Program in environmental biology. Environmental problems in Southern California ecosystems. Effects of human activities on desert, foothill, and wetland ecosystems. Offered as an intensive four-week summer field experience. (Equivalent to 1 hour lecture, 6 hours laboratory/fieldwork during a normal semester)

302 General Microbiology (4)

Prerequisites: biology majors, BIOL 274 and CHEM 120B with a "C" (2.0) or better; biochemistry majors, BIOL 273 and CHEM 120B with a "C" (2.0) or better. Introduction to structure and function of bacteria and viruses including beneficial and detrimental activities and interactions with other organisms. Laboratory provides investigations with microscopy, culture, physiology and genetics of microbes. (2 hours lecture, 6 hours laboratory)

303 Intermediate Cell Biology (3)

Prerequisites: biology majors, BIOL 274 and CHEM 120B with a "C" (2.0) or better; biochemistry majors, BIOL 273 and CHEM 120B with a "C" (2.0) or better; corequisite: CHEM 301A. Evidence-based examination of cells in action, roles of information, matter and energy flow as driving forces for compartmentation, protein sorting, metabolic and signaling pathways, motility and adhesion; examples taken from developmental, neural and cancer processes.

304 Supervised Biology Laboratory Instruction (2)

Prerequisites: BIOL 172, 273 or 274 and permission of instructor. For students interested in assisting in lower division biology lab that they have completed. Practical experience in laboratory teaching and introduction to major topics in biology education.

305 Human Heredity and Development (3)

Prerequisite: completion of G.E. category B.2. Principles of human heredity and embryology relating to human development. Mendelian genetics, single gene effects, genetics, prenatal diagnosis, and human embryology. No credit toward biological science major.

306 Biology of Aging (3)

Prerequisite: BIOL 101. Biological changes in cells, tissues, organs and the whole body associated with aging. Theories of aging will be discussed with primary emphasis on mammals. No credit toward biological science major.

309 Intermediate Molecular Biology (3)

Prerequisites: biology majors, BIOL 274 and CHEM 120B with a “C” (2.0) or better; biochemistry majors, BIOL 273 and CHEM 120B with a “C” (2.0) or better. Corequisite: CHEM 301A. Molecular and genetic basis of cellular functions. Role of gene expression and protein function in metabolism, physiology, growth, development. Introduction to recombinant DNA and its uses, and to critical analysis of primary literature.

310 Human Physiology (3)

Prerequisite: completion of G.E. category B.2. with a “C” (2.0) or better. Human physiological systems and their relationship to human function for non-biology majors and students in Kinesiology and Health Sciences. No credit for biological science major.

310L Human Physiology Laboratory (1)

Prerequisite: completion of G.E. category B.2. with a “C” (2.0) or better. Investigation of human physiology; the cellular to organ system level of muscular, cardiovascular, respiratory and renal systems; the neural and endocrine control of these systems. Labs emphasize functional aspects of each organ system. No credit toward biology major. (3 hours laboratory)

311 Nutrition and Disease (3)

(Same as CHEM 311)

314 Population and Community Ecology (3)

Prerequisites: completion of biology lower-division core. Introduction to the quantitative description of populations and communities, as well as the use of mathematical models to understand the dynamics of populations and communities. Links comparative, experimental and theoretical approaches to understanding the abundance and distribution of organisms and their interactions.

317 Field Marine Biology (4)

Prerequisites: completion of biology lower-division core. Field biology and natural history of local marine plants and animals. Identification of common species and factors determining their distributions and abundance in marine habitats. Effects of human activities on marine organisms. (2 hours lecture, 6 hours laboratory/fieldwork; weekend field trips may be required)

318 Wildlife Conservation (3)

Prerequisite: completion of G.E. Category B.2. Causes and consequences of loss of biological diversity, with an emphasis on wildlife populations and science-based conservation. Threatened and endangered species/ecosystems, ecosystem management, habitat restoration, captive species reintroductions and conservation legislation. No credit toward biology major.

319 Marine Biology (3)

Prerequisite: completion of G.E. Category B.2. Survey of marine plants and animals in their habitats. No credit toward biological science major.

322 Human Behavioral Ecology (3)

(Same as ANTH 322)

325 Principles of Evolution (3)

Prerequisites: completion of biology lower-division core. Mechanisms of evolutionary change, including mutation, selection, migration, and drift. Introduces methods for studying adaptations. Sexual selection, kin selection and evolution of life history strategies. Uses modern examples, including antibiotic resistance, to illustrate the relevance of understanding evolution.

330 Sustainability Ecology: American Indian Models (3)

Prerequisite: completion of G.E. Category B.2. Interrelationships of native peoples of the Americas with the local flora and fauna and the natural environment. Roles of American Indians in predator-prey interactions, ecological hierarchy, nutrient cycling, successional change and resource management. No credit toward biological science major.

340 Field Botany (3)

Prerequisites: completion of biology lower-division core. Native flora of Southern California. Identification, natural history and factors that determine the distribution of species. (1 hour lecture, 6 hours laboratory or fieldwork; weekend field trips are required)

344 Survey of the Land Plants (4)

Prerequisites: completion of biology lower-division core. Anatomical and morphological characteristics of the land plants as they relate to the evolutionary development and ecological strategies of these plants. (2 hours lecture, 6 hours laboratory)

352 Plants and Life (3)

Prerequisite: completion of G.E. Category B.2. Importance of plants in our lives, including such things as plant domestication and the origin of agriculture. Why plants are fascinating organisms. No credit toward biological science major.

360 Biology of Human Sexuality (3)

Prerequisite: completion of G.E. Category B.2. Biology of the human reproductive system, sexual differentiation, anatomy and physiology, sexual behaviors, procreation, contraception and sexually transmitted diseases. No credit toward biological science major. One or more sections offered online.

361 Human Anatomy (4)

Prerequisites: biology majors, BIOL 274 with a “C” (2.0) or better; biochemistry majors, BIOL 273 with a “C” (2.0) or better; health science and kinesiology majors, BIOL 101 and BIOL/KNES 210 or BIOL 310 with a “C” (2.0) or better. Systems approach to the structure and function of the human body. For biology majors and related health sciences. (2 hours lecture, 6 hours laboratory)

362 Mammalian Physiology (4)

Prerequisites: biology majors, BIOL 274 and CHEM 120B with a "C" (2.0) or better; biochemistry majors, BIOL 273 and CHEM 120B with a "C" (2.0) or better. Fundamental mechanisms of mammalian and human physiology. Integration of cellular and organ system functions with emphasis on regulatory processes. For biology majors and related health sciences. (3 hours lecture, 3 hours laboratory)

400 Seminar in Biology Education (2)

Prerequisites: BIOL 302, 303, 309 or 314 and permission of instructor. For students interested in biology education/science education. Students discuss major topics in biology education and conduct research. (2 hours lecture/discussion)

401 Biogeography (3)

Prerequisites: BIOL 314 or 325. Evolutionary patterns and mechanisms of the distribution of plants and animals in the major habitats of the world. Current concepts and theories.

402 Computer Lab in Molecular Systematics (3)

Prerequisites: BIOL 303, 309, 314 or 325. Gain practical and theoretical experience with software-based methods in molecular systematics, with emphasis on Internet resources for molecular biologists, acquisition of gene protein sequences, multiple sequence alignment, PCR primer design, phylogenetic analysis, and controversies in the field. (2 hours lecture, 3 hours laboratory)

404 Evolution (3)

Prerequisites: BIOL 309 or 325. History of evolutionary thought; origin of universe, earth and life; geological and paleontological history of the earth; evidence derived from comparative anatomy, embryology, genetics, zoogeography; mechanisms of evolution.

405 Developmental Biology (3)

Prerequisite: BIOL 303 or 309. Molecular and cellular processes in embryonic development encompassing mechanisms of fertilization, cell and tissue interactions, morphogenesis, organogenesis, and the regulation of gene expression.

407 Genes and Genomes (3)

Prerequisites: completion of BIOL 303 or 309 with a "C" (2.0) or better. Evolutionary pattern and process at a molecular biology level, emphasizing applications in biology, such as investigating genetic change within populations, estimating phylogenies, charting the evolution of gene families and comparing the content and organization of genomes. Not available for graduate degree credit.

409 Teaching Evolution: Online Course for Teachers (3)

Prerequisites: completion of biology lower-division core, G.E. Category B.2. or consent of instructor. Concepts of evolution, methods of teaching evolution, information competence and ethics. Technology employed for communication, collaboration, investigation and organization. If both BIOL 404 and 409 are taken, only BIOL 404 counts for biological science major.

411 Medical Genetics and Systems Biology (3)

Prerequisites: BIOL 302, 309, CHEM 421 or 423A. Advances in genetics, genomics, proteomics, and systems biology. Implications for the pharmaceutical industry, the clinic, and for genetic counseling. Uses of biological arrays in diagnosing and treating diseases.

412 Principles of Gene Manipulation (3)

Prerequisites: BIOL 309 and CHEM 301B. Current approaches to and applications of recombinant DNA technology. Principles behind construction of recombinant molecules including vectors and enzymes, introduction into organisms, selection, expression of cloned genes, and impact of research on society.

413 Advances in Molecular Genetics (3)

Prerequisites: BIOL 309 and CHEM 301B with a "C" (2.0) or better, or graduate standing. Function of genetic material and informational macromolecules. Extensive analysis of recent scientific articles in molecular genetics illustrating mutagenesis, protein synthesis, protein structure and function, biogenesis of RNA molecules, regulation of gene expression and their relationship to important biological processes.

414 Microbial Genetics (3)

Prerequisite: BIOL 302, 309, CHEM 421 or 423A. Perspective of genetics of microbial systems including background information, experimental methods, data interpretation, genetic analysis and applications to biotechnology.

417 Advances in Cell Biology (3)

Prerequisite: BIOL 303. Current topics in the cell biology of cell motility, cell multiplication and regulation, membranes and permeability, cell signaling, cell-to-cell contact and extracellular matrix, and cell differentiation using current journal articles.

418L Advances in Cell Biology Lab (2)

Prerequisite: BIOL 303. Use of current techniques like fluorescence microscopy, immunolabeling, ion-sensitive dye ratio-metry, image processing, and 2-D and 3-D reconstruction to study problems in cell biology, cellular developmental biology, and cellular neurobiology. (6 hours laboratory)

419 Marine Ecology (3)

Prerequisite: BIOL 314 or 325. Ecology of planktonic, nektonic and benthic organisms; their communities and environments.

419L Marine Ecology Laboratory (1)

Corequisite: BIOL 419. Field and laboratory studies of planktonic, nektonic and benthic communities. (3 hours laboratory or field work; weekend field trips may be required)

422 Coastal Ecology (4)

Prerequisites: BIOL 314 or 325. Ecology of coastal populations and communities with emphasis on rocky intertidal or other marine or ocean-influenced habitats. Field and laboratory experiments and studies of ecological processes affecting species distributions and abundances. (2 hours lecture, 6 hours laboratory/field work; weekend field trips may be required)

424 Immunology (4)

Prerequisites: BIOL 302, and 303 or 309. Molecular, cellular and organismic nature of the immune process. Inflammation, phagocytosis, antigens, immunoglobulins and cell-mediated immune phenomena. Modern immunology techniques. (2 hours lecture, 6 hours laboratory)

426 Virology (3)

Prerequisite: BIOL 303 or 309. Viral structure and replication and host-virus interactions in the viral replication process, with emphasis on animal and bacterial virus systems.

427 Stem Cell Biology (3)

Prerequisite: BIOL 303 or 309, BIOL 405 recommended. Historical context, principles, methodology, clinical impact on society and the individual, recent relevant scientific facts and progress, controversies and perspective of stem cell biology, focusing on applications to regenerative medicine and tissue engineering.

428 Biology of Cancer (3)

Prerequisite: BIOL 303, 309, 314 or 325. BIOL 424 recommended. Cancer problem as a dilemma of biology. Clinical and epidemiological aspects. Current research.

429 Techniques in Stem Cell Biology (3)

Prerequisites: BIOL 302, and 303 or 309. Introduction to cell-culture and stem cell laboratory research techniques; focus on advanced-level biology experiments, fundamental characteristics of stem cells and differentiation of mouse or government-approved human stem cell-lines into several phenotypes. (6 hours laboratory and 1 hour discussion per week)

430 Advances in Microbiology (3)

Prerequisite: BIOL 302 or graduate standing. Current topics in microbiology virulence mechanisms, antibiotics, host-bacterium interaction, mobile DNA elements, secretion systems, select agents, differentiation, and development.

436 Advanced Applied Statistics (4)

Prerequisites: MATH 337, 338 or graduate standing. Linear models, including mixed models, applied to experimental and field data from current research projects. Poisson and logistic regression. Model fitting and checking; use of permutation tests as needed. Presentation of results suitable for publication. (3 hours lecture, 3 hours laboratory) (Same as MATH 436)

438 Public Health Microbiology (4)

Prerequisite: BIOL 302. Control and epidemiology of infectious diseases of public health importance, water and sewage microbiology. Control of current problems. (2 hours lecture, 6 hours laboratory)

441 Plant Taxonomy (4)

Prerequisites: completion of biology lower-division core. Classification and evolution of vascular plants; emphasis on the flowering plants. (2 hours lecture, 6 hours laboratory or fieldwork; weekend field trips may be required)

442 Pollination Biology (3)

Prerequisites: completion of biology lower-division core. Pollination in the plant kingdom. Floral cues, pollination syndromes, pollinator behavior, chemical and physical characteristics of pollination, energetics, gene flow, phenology, and ecological aspects of pollination. (2 hours lecture, 3 hours laboratory or fieldwork)

443 Plant Ecology (4)

Prerequisite: BIOL 314. Community and population ecology of terrestrial plants. Environmental factors and plant distribution with emphasis on California vegetation. (2 hours lecture, 6 hours laboratory or fieldwork; weekend field trips may be required)

444 Plant Physiological Ecology (4)

Prerequisites: completion of biology lower-division core. BIOL 445 recommended. Fundamental mechanisms of plant physiological responses to the environment with primary emphasis on whole plants and ecosystems. (2 hours lecture, 6 hours laboratory or field work; weekend field trips may be required)

445 Plant Cell Physiology (3)

Prerequisites: BIOL 302, 309, 314, CHEM 421 or 423A. Cellular and molecular mechanisms of behavior, growth, transport processes, and environmental responses in vascular plants. Plant cell development, nutrition, respiration, photosynthesis, hormones, photoperiodism, and stress biology.

446 Marine Phycology (4)

Prerequisites: completion of biology lower-division core. Biological aspects of marine algae; comparative development, morphology, taxonomy, physiology, and ecology. (2 hours lecture, 6 hours laboratory or fieldwork; weekend field trips may be required)

447 Ethnobotany (3)

Prerequisites: BIOL 314 or 325. How people interact with plants and the environment, including such things as western medicinal plant use, traditional medicine and dentistry, exotic foods and conservation. (2 hours lecture, 3 hours laboratory; weekend field trips may be required)

448 Plant Molecular Biology (3)

Prerequisite: BIOL 302, 303, 309, CHEM 421 or 423A. Genetic mechanisms in vascular plants controlling metabolism, growth, development, and responses to biotic/abiotic environmental stresses. Molecular regulation of gene expression and transduction of internal and external signals.

449 Desert Ecology (4)

Prerequisites: BIOL 314 or 325. Adaptations, distributions and interactions of desert plants, animals and microbes, including the influences of environmental factors. (2 hours lecture, 6 hours laboratory or fieldwork; weekend field trips may be required)

450 Conservation Biology (3)

Prerequisite: BIOL 314 or 325. Current topics involving theory, concepts and techniques in the conservation of biological diversity.

451 Advanced Human Evolution (3)

(Same as ANTH 451)

453 Life Science Concepts (3)

Prerequisites: BIOL 101 or 102 and junior or senior standing. Biological principles using science processes appropriate for elementary teachers. No credit for biological science major. (2 hours lecture, 2 hours activity)

456 Hormones and Behavior (3)

(Same as ANTH 456)

461 Marine Invertebrate Biology (4)

Prerequisite: Completion of biology lower-division core. Evolution, classification, phylogeny, morphological and physiological adaptations of marine invertebrate animals. Dissection, identification and observation of extant animals. (2 hours lecture, 6 hours laboratory or fieldwork; weekend field trips may be required)

462 General Parasitology (4)

Prerequisite: BIOL 302. Survey of various animal parasites with an emphasis on the morphology, physiology, and genetics of human protozoans and helminthes. Other topics will include vectors and common parasites of domestic animals. (3 hours lecture, 3 hours laboratory)

465 Integrative Biology of Spider Silk (3)

Prerequisites: completion of BIOL 303, 309, 314 or 325 with a "C" (2.0) or better. Inter-relationships and applications of diverse biological principles using spider silk as an organizing theme. Synthesis and use of silk from multiple perspectives, including but not limited to, molecular genetics, behavior and evolution.

466 Behavioral Ecology (3)

Prerequisites: completion of biology lower-division core. Current problems in the evolution of animal behavior; the origin and maintenance of social systems and behavioral interactions of animals.

467 Entomology (4)

Prerequisites: completion of biology lower-division core. Anatomy, physiology, evolution and biology of insects and other terrestrial arthropods. Dissection, collection, identification and observation of living arthropods. (2 hours lecture, 6 hours laboratory or fieldwork; weekend field trips may be required)

468 Comparative Animal Physiology (4)

Prerequisites: completion of biology lower-division core and CHEM 120B. Comparative study of physiological and biochemical processes among representative animals. (3 hours lecture, 3 hours laboratory, weekend field trips may be required)

470 Cellular Neurobiology (3)

Prerequisites: BIOL 303 or 309, and 362. Processes of cell communication, particularly in nervous systems. Molecular biology of neurons, model sensory and motor systems, and cellular basis for behavior.

472A Advances in Biotechnology Laboratory (3)

Prerequisites: BIOL 302 and 309, CHEM 421 or 423A. Corequisite: CHEM 412. First semester explores biotechnology techniques for DNA cloning and analysis: restriction enzyme action, DNA sequencing, sequence analysis by computer, plasmid cloning, genomic library production and screening, DNA probe hybridization. (1 hour lecture/discussion, 6 hours laboratory) (Same as CHEM 472A)

472B Advances in Biotechnology Laboratory (3)

(Same as CHEM 472B)

473 Bioinformatics (3)

Prerequisites: CHEM 301B, 302 and BIOL 325 or CHEM 421. Provides a research-based, problem-solving experience using the tools and algorithms of molecular and computational biology to analyze genetic and protein sequences retrieved from appropriate databases. (2 hours lecture, 3 hours computer laboratory) (Same as CHEM 473)

474 Natural History of the Vertebrates (4)

Prerequisites: completion of biology lower-division core. Natural history of the vertebrates. Observation, identification, behavior, ecology and distribution of the vertebrates. (2 hours lecture, 6 hours laboratory/fieldwork; weekend field trips may be required)

475 Ichthyology (4)

Prerequisites: completion of biology lower-division core. Systematics, evolution, morphology, physiology, ecology and behavior of fishes. (2 hours lecture, 6 hours laboratory/fieldwork; weekend field trips may be required)

476 Herpetology (4)

Prerequisites: completion of biology lower-division core. Biology, structure, physiology, ecology, distribution, identification, collection, evolution and behavior of amphibians and reptiles. (2 hours lecture, 6 hours laboratory or fieldwork; weekend field trips may be required)

477 Advances in Biotechnology (3)

(Same as CHEM 477)

478 Mammalogy (4)

Prerequisites: completion of biology lower-division core. Systematics, evolution, morphology, physiology, ecology and behavior of mammals. (2 hours lecture, 6 hours laboratory/field-work; weekend field trips may be required)

479 Ornithology (4)

Prerequisites: completion of biology lower-division core. Anatomy, physiology, evolution, behavior, and ecology of birds. Laboratory and fieldwork in identification, anatomy, observational techniques and community composition. (2 hours lecture, 6 hours laboratory/fieldwork; weekend field trips may be required)

480 Advanced Topics in Undergraduate Biology (1-3)

Prerequisites: junior or senior students majoring in biological science and consent of instructor. Current topics, updating of concepts, recent advances and unification of the principles of biology. May be repeated for credit.

480D Colloquium: Diverse Topics in Biology (1)

Prerequisites: Must have passed at least one, or be concurrently enrolled in any upper-division Biology course (300 or 400 level). Diverse research topics and perspectives in the biological sciences. Presented by biologists from CSUF and invited speakers from other universities, industries, governmental agencies or private organizations. May be repeated for credit.

480E SCERP Proseminar (1)

Prerequisites: selection as a Southern California Ecosystems Research Program (SCERP) Scholar. Increase the experience and skills of SCERP Scholars in working on problems in environmental biology. Discussion of publications, development and presentation of SCERP research. Offered Credit/No Credit only. May be repeated for credit.

480M MARC Proseminar (1)

Prerequisite: selection as MARC Fellow. Intended to increase the contact of MARC Fellows with minority scientists of national repute who will present seminars. Fellows will read and discuss relevant primary literature, attend the seminars, and meet with speakers before and after the seminars. May be repeated for credit. (Same as CHEM and PSYC 480M)

480S Howard Hughes Medical Institute Scholars Proseminar (1)

(Same as CHEM 480S)

481 Advances in Evolution and Ecology (3)

Prerequisites: BIOL 314 or 325. Current topics in evolutionary biology and ecology. Examination and analysis of current literature relating to evolutionary biology, population, community, and ecosystem ecology, behavioral ecology and evolutionary ecology.

482 Capstone Studies in Biology (2)

Prerequisite: consent of department; for Biological Science majors who have completed 90 units. Individualized practical experience related to the study of biology or pursuit of a biology career that reflects paradigms of the discipline. Application and integration of biological concepts and skills through library research, applied projects or community service activities. Not available for graduate degree credit.

495 Biological Internship (3)

Prerequisites: successful completion of 90 units, including all core requirements, and consent of instructor. Biological, ecological, and health-related fields. Ninety (90) hours of practical experience in student's chosen field of interest with public or private agencies or businesses. May not be repeated for credit. (1 hour lecture/discussion, 6 hours laboratory work experience)

496 Biology Tutorials (1-3)

Prerequisites: completion of biology lower-division core and consent of instructor. Supervised experience in biological science teaching through tutoring or assisting in a laboratory or field class. No credit toward biological science major.

498 Senior Thesis (1-2)

Prerequisite: 6 units of BIOL 499L (two units may be taken concurrently). Thesis committee must approve research plan at least two semesters prior to enrollment in this course. Requires preparation, presentation and defense of a formal thesis. May be repeated for a total of 2 units.

499L Independent Laboratory Study (1-3)

Prerequisite: junior or senior standing with consent of instructor with whom the student wishes to pursue independent laboratory study in biology. May be repeated for credit.

500A Professional Aspects of Biology (1)

Prerequisites: graduate standing and concurrent enrollment in BIOL 500B. Discussions concerning research protocol, scientific methodology and communication techniques. Ethics and social responsibilities of professional biologists. (1 hour discussion)

500B Professional Aspects of Biology (1)

Prerequisites: graduate standing and concurrent enrollment in BIOL 500A. Individualized project work and experiences in scientific writing. Required of all students upon admission to the graduate program. (3 hours project work)

500C Professional Aspects of Biology: Teaching Effectiveness (2)

Pre- or corequisites: graduate standing; must have received a Graduate Teaching Associate appointment and attend two mandatory preparation meetings on the Thursday and Friday prior to beginning of classes. Assists graduate students in becoming effective classroom teachers and understanding the scholarship of teaching in higher education. Graduate Teaching Associates will learn pedagogy and a variety of teaching alternatives while concurrently teaching in a laboratory/discussion setting.

505T Seminar in Molecular, Cellular, Immunological and Physiological Biology (3)

Prerequisite: graduate standing. Selected advanced topics. May be repeated for credit.

507 Genes and Genomes (3)

Prerequisite: graduate standing. Evolutionary pattern and process at a molecular biology level, emphasizing applications in biology, such as investigating genetic change within populations, estimating phylogenies, charting the evolution of gene families and comparing the content and organization of genomes.

517T Seminar in Ecological and Organismic Biology (3)

Prerequisite: graduate standing. Selected advanced topics. May be repeated for credit.

520T Seminar in Microbiology (3)

Prerequisite: graduate standing. Selected advanced topics. May be repeated for credit.

522 Coastal Ecology (3)

Prerequisites: graduate standing in biology. Ecology of coastal population and communities with emphasis on rocky intertidal or other marine or ocean-influenced habitats. Field and laboratory experiments and studies of ecological processes affecting species distributions and abundances. (2 hours lecture, 6 hours laboratory/fieldwork; weekend field trips may be required)

546 Marine Phycology (4)

Prerequisites: graduate standing in biology. Biological aspects of marine algae; comparative development, morphology, taxonomy, physiology and ecology. (2 hours lecture, 6 hours laboratory or fieldwork; weekend field trips may be required)

547 Ethnobotany (3)

Prerequisites: graduate standing. Ethnobotanical investigation of plants and human culture. Develop skills to conduct original ethnobotanical research through voucher collections, plant identification, participant observation, interviews, experimentation and critique of scholarly research. (2 hours lecture, 3 hours laboratory, weekend field trips may be required)

565 Integrative Biology of Spider Silk (3)

Prerequisite: graduate standing. How sub-disciplines of biology contribute to understanding the production and use of silk by spiders. Topics range from molecular genetics to behavior and evolution.

570 Survey of Molecular Biology and Pharmacology/ Toxicology (3)

Prerequisites: enrollment in Master of Biotechnology (MBt) degree program or consent of instructor, and MGMT 540. Corequisites: BIOL/MATH 571 and CPSC/BIOL 572. Molecular biology, pharmacology and toxicology concepts as applied to the development of pharmaceutical products and biomedical devices. Students work collaboratively toward a final project to propose a new pharmaceutical product and/or biomedical device. (Same as CHEM 570)

571 Survey of Mathematical Modeling and Bioinformatics (3)

Prerequisites: enrollment in Master of Biotechnology (MBt) degree program or consent of instructor, and MGMT 540. Corequisites: BIOL/CHEM 570 and CPSC/BIOL 572. Introduction to the strategies, approaches and computer applications utilized for drug discovery and design, database design and data mining. Case studies will illustrate specific applications of the methods of measuring, visualizing, representing, inferring, clustering classifying, and modeling biotechnological data. (Same as MATH 571)

572 Survey of Pharmaceutical and Medical Devices Technology (3)

(Same as CPSC 572)

580 Advanced Topics in Graduate Biology (1-3)

Prerequisites: graduate standing in biology and consent of instructor. Current research topics, experimental design and problem solving in biological systems. May be repeated for credit.

580D Biology Colloquium (1)

Prerequisite: graduate standing. Series of scholarly presentations covering diverse research topics and perspectives in the biological sciences. Scientific presentations by biologists from CSUF and other universities, industries, governmental agencies or private organizations. May be repeated for credit.

597 Project (1-3)

Prerequisite: graduate standing in an appropriate master's degree program. Planning, preparing and completing an applied master's degree project. Credit only for completed written project report and oral presentation, both of which must be formally approved by the master's program committee. (Not acceptable for research-based thesis master's degree programs)

598 Thesis (1-3)

Open to graduate students with consent of instructor with whom the student is conducting graduate thesis research. May be repeated for a maximum of 6 units of credit.

599 Independent Graduate Research (1-3)

Open to graduate students with consent of instructor with whom the student wishes to pursue independent study in biology. May be repeated for credit.

Business Administration

Mihaylo College of Business and Economics

ASSOCIATE DEAN, ACADEMIC PROGRAMS AND FACULTY DEVELOPMENT

Terry Grant

DEPARTMENT OFFICE/COLLEGE WEBSITE

Steven G. Mihaylo 3100
657-278-4652
www.business.fullerton.edu

PROGRAMS OFFERED

Bachelor of Arts in Business Administration

Concentrations in: Accounting, Business Economics, Entertainment and Tourism Management, Entrepreneurship, Finance, Information Systems, Management, Management Science, Marketing, and Risk Management and Insurance
Joint Emphasis in Accounting and Finance

Joint Emphasis in Accounting and Information Systems

Minor in Business Administration

Minor in Entrepreneurship

Minor in Information Systems

Master of Business Administration

Concentrations in: Accounting, Business Economics, Business Intelligence, Entrepreneurship, Finance, Information Systems, International Business, Management, Management Science, Marketing, and Risk Management and Insurance

FACULTY

April Franklin, Linda Fraser, Marcia Lichty, Dana Lowey, Teeanna Rizkallah

INTRODUCTION

This major prepares students for beginning professional-level positions in business and administration in the private and public sectors. Career opportunities range from accounting, cost analysis, marketing research and statistical forecasting to real estate, personnel, sales and information systems. This curriculum also provides a foundation for advanced study.

LEARNING GOALS AND STUDENT LEARNING OUTCOMES

The following goals and learning outcomes have been established for students pursuing a degree in business administration:

Problem solving and critical thinking skills

- Effectively use quantitative/analytical, problem-solving and critical thinking skills in a business situation

Interpersonal relations

- Motivate self and others to achieve group and organizational goals
- Diagnose and resolve conflict in group and organizational settings

Ethical awareness

- Demonstrate an awareness of ethical issues and responsibilities

Functional knowledge

- Understand and appreciate the principles and roles of each of the major business disciplines and the interrelationships of these disciplines within a strategic framework

Multicultural awareness

- Appreciate diversity and understand how workforce and market diversity challenge, benefit and influence the activities of the organization

Information technology skills

- Use information technology to support business analysis and operations

Global awareness

- Understand the impact of the global economy and business environment

Economic and legal environment knowledge

- Demonstrate knowledge about the economic and legal environments in which business operates

Communications skills

- Demonstrate knowledge and skills to communicate effectively about business issues using written and oral communications

BACHELOR OF ARTS IN BUSINESS ADMINISTRATION (120 UNITS)

Admission to the Business Administration Major

Admission to the Business Administration major involves two steps. Students who apply to the major are initially classified as Pre-business. After completing the lower-division core requirements with grades of at least "C" (2.0), students may apply to the Business Administration major.

All of the following requirements must be met for the degree. Students must earn a grade of at least "C" (2.0) in each core course listed below. For assistance in interpreting these requirements, contact the Business Advising Center.

Required Lower-Division Core Courses

- ACCT 201A Financial Accounting (3)
- ACCT 201B Managerial Accounting (3)
- BUAD 201 Business Writing (3)
- ECON 201 Principles of Microeconomics (3)
- ECON 202 Principles of Macroeconomics (3)
- MGMT 246 Business and Its Legal Environment (3)
- ISDS 265 Introduction to Information Systems and Applications (3)
- MATH 135 Business Calculus (3)
 - OR MATH 130 Short Course in Calculus (4)
 - OR MATH 150A Analytic Geometry and Calculus (4)

Required Upper-Division Core Courses

- BUAD 301 Advanced Business Communication (3)
- ECON 315 Intermediate Business Microeconomics (3)†
 - OR ECON 310 Intermediate Microeconomic Analysis (3)*
 - OR ECON 320 Intermediate Macroeconomic Analysis (3)‡
- FIN 320 Business Finance (3)
- MGMT 339 Principles of Management and Operations (3)
- MGMT 340 Organizational Behavior (3)
- ISDS 361A Quantitative Business Analysis: Probability and Statistics (3)
- ISDS 361B Quantitative Business Analysis: Statistics and Management Science (3)
- MKGT 351 Principles of Marketing (3)

* Required of business majors with a concentration in economics

† Required of business majors

‡ May be taken by business majors, in lieu of ECON 315

Required Capstone Core Course

- MGMT 449 Seminar in Strategic Management (3)

Required Concentration Courses (18 units minimum)

See listing of concentration requirements below.

Global Business Requirement

Complete one three-unit course in the area of Global Business. The course must be selected from the list of Approved Global Business Courses and may not be a course in your concentration. The approved list is available in the Business Advising Center.

Other Requirements, Grades and Residence

Grade-Point Average (GPA). Maintain at least a 2.0 grade point average in all college level units attempted, in all units attempted at CSUF, in all units attempted in the major and in all units attempted in the concentration. Earn at least a "C" (2.0) grade in each core course and in each of the following concentrations: accounting, information systems and management science. A grade of "C-" (1.7) or lower is not a passing grade.

Grade option. Take all required core courses and all required concentration courses in the Mihaylo College of Business and Economics for a letter grade (A,B,C,D,F). The Credit/No Credit grading option may not be used for these courses, and a grade of CR (credit) will not satisfy the requirements for the degree. Exception: Courses in calculus may be taken under the Credit/No Credit grading option; however, if it is also taken to meet general education requirements then it must be taken for a letter grade.

Residence. At least 30 units in the major and at least one-half of the units in the concentration (except accounting, which requires 15) must be taken in residence in the Mihaylo College of Business and Economics; at least 15 of the last 24 units before graduation must be taken in residence in the Mihaylo College of Business and Economics.

ACCOUNTING CONCENTRATION (21 UNITS)

- ACCT 301A,B Intermediate Accounting (3,3)
- ACCT 302 Cost Accounting (3)
- ACCT 307 Accounting Information Systems (3)
- ACCT 308 Concepts of Federal Income Tax Accounting (3)
- Two courses from the following (6 units):*
- ACCT 401, 402, 403, 405, 408, 420, 422, 460, 470

BUSINESS ECONOMICS CONCENTRATION (18 UNITS)

All students with an economics concentration are required to take ECON 310 or 315 as part of their business administration core requirements. In addition, the concentration requires ECON 320, 340 and 12 units of upper-division economics electives, 6 units of which must be at the 400 level.

Students interested in economics also may wish to consider the Bachelor of Arts in Economics.

ENTERTAINMENT AND TOURISM MANAGEMENT CONCENTRATION (18 UNITS)

Required courses (15 units)

- BUAD 360 Entertainment Money Management (3)
- MGMT 365 Entertainment Business (3)

- MGMT 446 Entertainment Law (3)
 MGMT 470 Entertainment Operations (3)
 MGMT 471 Tourism Management (3)

Interdisciplinary Electives (3 units)

Three units of coursework electives chosen in consultation with a departmental adviser

ENTREPRENEURSHIP CONCENTRATION (18 UNITS)

- ACCT 463 Financial Controls for Entrepreneurs (3)
 MGMT 461 Entrepreneurial Management
 MGMT 464 Entrepreneurial Leadership (3)
 MGMT 465A New Venture Creation and Funding (3)
 MGMT 465B New Venture Launch (3)
 MGMT 462 Marketing for Entrepreneurs (3)

FINANCE CONCENTRATION (18 UNITS)

Required Courses (6 units)

- FIN 332 Theory of Corporate Finance (3)
 FIN 340 Introduction to Investments (3)
 OR FIN 342 Capital and Money Markets (3)

Electives (12 units)

Students are encouraged to choose as many courses as possible from one of the following and are expected to consult with faculty advisers when selecting courses.

Corporate/International Financial Management Track

- FIN 331, 335, 342, 370, 371, 373, 432, 433

Financial Institutions Track

- FIN 335, 342, 351, 352, 370, 425, 444

Insurance and Financial Service Track

- FIN 335, 342, 360, 410, 411, 461, 462

Investments/Financial Planning Track

- FIN 335, 342, 355, 360, 410, 411, 442, 444

Note: To be eligible to sit for the Certified Financial Planner Examination, students must take all of the following: FIN 340, 355, 360, 410, 411 and ACCT 358.

Real Estate Professions Track

- FIN 351, 352, 353, 355, 454, 456

Note: To be eligible to sit for the Real Estate Broker License Examination, students must have completed eight college-level courses, in addition to meeting the experience/educational requirements. Five of the courses are required, including: Real Estate Practice (not offered at CSUF); Legal Aspects of Real Estate (not offered at CSUF); Real Estate Finance (FIN 352); Real Estate Appraisal (FIN 353); and Real Estate Economics (FIN 454). In lieu of Real Estate Economics, the student may complete ECON 201, 202, 361 or ACCT 201A or 201B. In addition to the five required courses,

the student is required to complete three courses from a long list of electives, including the following courses offered at CSUF: Real Estate Principles (FIN 351); Advanced Real Estate Finance (FIN 355); Advanced Real Estate Appraisal (FIN 551); and Business Law (MGMT 246). For detailed information, please visit the California Department of Real Estate website.

INFORMATION SYSTEMS CONCENTRATION (21 UNITS)

- ISDS 309 Introduction to Operating Systems and programming (3)
 ISDS 312 Database Management Systems (3)
 ISDS 406 Systems Analysis and Design (3)
 ISDS 409 Business Telecommunications for Information Systems Design (3)
 ISDS 454 Seminar in Information Systems Development (3)
Two courses from the following (6 units):
 ISDS 371, 372, 411, 414, 415, 418, 431, 433, 435, 437, 474

MANAGEMENT CONCENTRATION (18 UNITS)

Select one of the following emphases:

General Management (18 units)

- MGMT 343 Human Resource Management (3)
 OR MGMT 443 Team Leadership Skills (3)
 MGMT 425 Productivity and Quality Management (3)
 MGMT 440 Emerging Issues in Management (3)

Nine units of elective coursework chosen in consultation with a department adviser.

Human Resources Management (18 units)

- MGMT 343 Human Resource Management (3)
 MGMT 432 Staffing (3)
 MGMT 434 Compensation (3)

Six units of elective coursework in consultation with a department adviser.

Legal Studies (18 units)

- MGMT 348 Commercial Law (3)
 MGMT 445 employment Law (3)

12 units from the following:

- MGMT 346, 349, 440, 441, 446, 447

Operations Management (18 units)

- MGMT 422 Production and Inventory Control (3)
 MGMT 423 Purchasing and Supply Management (3)
 MGMT 425 Productivity and Quality Management (3)
 MGMT 430 Integrated Supply Chain Management (3)

Six units of elective coursework in consultation with a department adviser

**MANAGEMENT SCIENCE CONCENTRATION
(18 UNITS)**

Required Courses (9 units)

ISDS 309 Introduction to Operating Systems and Programs (3)
ISDS 406 Systems Analysis and Design (3)
ISDS 440 Integrative Decision Tools for Business Operations (3)
OR ISDS 442 Business Modeling Using Spreadsheets (3)

One Course from Statistical Concepts (3 units)

ISDS 422, 461, 467, 472, 473, 474, 475

Electives (6 units)

ISDS 312, 411, 415, 465, 490

ECON 440

FIN 360, 444

MGMT 422, 430, 444

MATH 390

An additional course in Statistical Concepts (3)

MARKETING CONCENTRATION (18 UNITS)

Required Courses (9 units)

MKGT 353 Marketing Information Technology (3)
MKGT 370 Buyer Behavior (3)
MKGT 379 Marketing Research Methods (3)

Electives (6 units)

MKGT 401, 405, 415, 425, 430, 445, 455, 462, 465, 475

Marketing Concentration Capstone Course (3 units)

MKGT 489 Developing Marketing Strategies (3)

**RISK MANAGEMENT AND INSURANCE
CONCENTRATION (18 UNITS)**

Required Course (3 units)

FIN 360 Principles of Insurance (3)

Electives (15 units)

FIN 332, 335, 340, 410, 411, 461, 462, 463, 464

MATH 390

**JOINT EMPHASIS IN ACCOUNTING AND FINANCE
(30 UNITS)**

ACCT 301A Intermediate Accounting (3)
ACCT 301B Intermediate Accounting (3)
ACCT 302 Cost Accounting (3)
ACCT 422 Internal Audit Control (3)
ACCT 460 Seminar in Financial Statement Analysis (3)
FIN 332 Theory of Corporate Finance (3)
FIN 340 Introduction to Investments (3)

FIN 370 International Business Finance (3)

FIN 432 Financial Forecasting and Budgeting (3)

FIN 433 Problems in Business Finance (3)

**JOINT EMPHASIS IN ACCOUNTING AND
INFORMATION SYSTEMS (30 UNITS)**

ACCT 301 Intermediate Accounting (3)
ACCT 301B Intermediate Accounting (3)
ACCT 302 Cost Accounting (3)
ACCT 422 Internal Audit Control (3)
ISDS 309 Introduction to Programming (3)
ISDS 312 Database Management Systems (3)
ISDS 406 Systems Analysis and Design (3)
ISDS 418 Privacy and Security (3)
ISDS 435 Integrated Enterprise Information Systems (3)

MINOR IN BUSINESS ADMINISTRATION (27 UNITS)

Business administration minors shall not enroll in any required upper-division course (in the minor) until they have completed all of the required lower-division courses (in the minor) with a grade of at least "C" (2.0) in each course. Students must earn a grade of at least "C" (2.0) in each course required for the minor.

Required Lower-Division Courses

ACCT 201A,B Financial and Managerial Accounting (3,3)
ECON 201 Principles of Microeconomics (3)
ECON 202 Principles of Macroeconomics (3)
ISDS 265 Introduction to Information Systems and Applications (3)
MGMT 246 Business and Its Legal Environment (3)

Required Upper-Division Courses

Note: Enrollment in these courses requires the completion of all lower-division minor requirements with a grade of "C" (2.0) or better in each course.

FIN 320 Business Finance (3)
MGMT 339 Principles of Management and Operations (3)
OR MGMT 340 Organizational Behavior (3)
MKGT 351 Principles of Marketing (3)

Economics Majors minoring in Business Administration

Economics Majors can complete a minor in business administration by taking ACCT 201B, MGMT 246, FIN 320, MGMT 339 or 340 and MKGT 351. All other required courses for the minor are required for the major in Economics.

MINOR IN ENTREPRENEURSHIP* (18 UNITS)

Students must earn a grade of at least “C” (2.0) in each course listed below.

Required Courses (18 units)

ACCT 201A Financial Accounting (3)

BUAD 210 Understanding Business (3)

FIN 320 Business Finance (3)

MGMT 465A New Venture Creation and Funding (3)

MGMT 465B New Venture Launch (3)

MKGT 351 Principles of Marketing (3)

Note: Students are advised to have a working knowledge of Excel and to have completed a college-level course in statistics that covers regression prior to enrolling in upper-division courses for the Entrepreneurship minor.

MINOR IN INFORMATION SYSTEMS* (18 UNITS)

Students must earn a grade of at least “C” (2.0) in each course listed below.

ACCT 201A Financial Accounting (3)

ISDS 265 Introduction to Information Systems and Applications (3)

ISDS 309 Introduction to Operating Systems and Programming (3)

ISDS 310 Systems Analysis and Design (3)

ISDS 408 Database Management Systems (3)

One of the following:

ISDS 371, 372, 411

*Students with a major in business administration may not minor in entrepreneurship or information systems. Interested students may elect to complete a second concentration in entrepreneurship or information systems.

MASTER OF BUSINESS ADMINISTRATION DEGREE – MBA (33 UNITS MINIMUM)

The Mihaylo College of Business and Economics holds dual accreditation in business administration and accounting from AACSB International, the premier accrediting body for university-level business programs in the world. We are the only university in Orange County, and one of five in California, to hold this prestigious level of dual accreditation. Our accreditation guarantees that students receive a high quality education, delivered by the most qualified faculty, all from a College that has met the highest standards in business education.

Depending on personal and professional commitments, students may earn their MBA on a full- or part-time basis. Classes are offered during the late afternoon and evenings, and students may complete their program at either the main campus in Fullerton or at the CSUF Irvine Campus.

Admission

Admission into the MBA program is competitive and decisions are based on the holistic assessment of each candidate’s academic and personal/professional background. Applicants will be evaluated based on the following criteria:

1. an acceptable bachelor’s degree from an appropriately accredited institution;
2. a minimum grade-point average of at least 2.5 in the last 60 semester units attempted and in good standing at the last college attended;
3. a satisfactory score on the Graduate Management Admission Test (GMAT). Students should score in the top 50 percent on the verbal, quantitative and analytical writing areas;
4. a minimum TOEFL score of 570 on the paper exam, or 90 on the internet based (iBT) is required¹; and
5. a recommendation from the MBA Admissions Committee based upon a review of the above requirements, the student’s “Statement of Purpose” and prior work experience.

Additional coursework may be required of admitted students who holistically satisfy the criteria but are weak in one of the above areas.

¹ For international students

Program of Study

Students with a bachelor’s degree in business administration may be able to complete the program with a minimum of 33 units. However, those students with little or no recent coursework in business administration may require up to 48 total units. The difference is explained below as “Foundation Courses.” Each student in the MBA program must complete an adviser-approved Study Plan.

All newly admitted students must demonstrate proficiency in calculus, software applications and statistics either at the time of admission or within their first year of study. The three technical courses listed below or equivalent coursework must be completed with grades of at least a “C” (2.0):

MATH 135 Business Calculus (3)

ISDS 265 Introduction to Information Systems and Applications (3)

ISDS 361A Quantitative Business Analysis: Probability and Statistics (3)

OR ISDS 513 Statistical Analysis (3)

Foundation Courses

The MBA program at CSUF presumes that all students demonstrate proficiency in the topics covered by the following Foundation Courses, either by having completed the courses or their equivalent before acceptance into the master’s program or by taking them as part of their Study Plan. Decisions about equivalency are made by College Advisers and Department Chairs within the Mihaylo

College of Business and Economics. Prior coursework may be used to demonstrate proficiency, provided that the proposed equivalent courses are no more than seven years old and that the student has achieved at least a "C" (2.0) grade with an overall GPA of 3.0 (B). The Foundation Courses are:

- ACCT 510 Financial Accounting (3)
- ACCT 511 Seminar in Managerial Accounting (3)
- ECON 515 Microeconomic Perspective for Managers (3)
- FIN 517 Managerial Finance (3)
- ISDS 514 Decision Models for Business and Economics (3)
- MGMT 515 Management of Information in the Corporate Environment (3)
OR ECON 521 Macroeconomic Perspective for Managers (3)
- MGMT 516 Operations Management (3)
- MGMT 518 Legal and Ethical Environment of Business (3)
- MGMT 524 Seminar in Organizational Behavior and Administration (3)
- MKGT 519 Marketing Management (3)

MBA STUDY PLAN (33-48 UNITS)

Students electing the International Business concentration must complete a minimum of 36 units of adviser-approved coursework. A minimum 3.0 GPA (B) is required in Study Plan courses and overall applicable coursework. Any Study

Any study plan course with a grade lower than "C" (2.0) must be repeated with at least a "C" (2.0) grade.

Required Courses (18 units minimum)

All MBA students must complete a required core of six adviser-approved courses (18 units). These must be at the 500 level. Up to four additional Foundation Courses may be required for those students who enter the program with a limited background in business fields. All specific required courses are determined in consultation with the College Advisers and/or Department Chairs within the Mihaylo College of Business and Economics.

MBA Concentration Elective Courses (12 -15 units)

A student may elect to follow a Generalist path within the MBA or select from one of the 11 concentration areas to tailor their degree towards their individual professional, personal and educational goals. Concentrations are offered in the following areas: Accounting, Business Intelligence, Economics, Entrepreneurship, Finance, Information Systems, International Business, Management, Management Science, Marketing, and Risk Management and Insurance. All concentrations require four courses from within the thematic area (12 units). A minimum of two of the four courses must be at the 500 level. The International Business concentration requires five courses (15 units). All concentration courses must be approved by the Department Chairs or their designee. The Generalist approach consists of 12 units from differing areas, with no more

than two electives from any one disciplinary area. Specific courses in that plan must be approved by the Associate Dean or designee.

Within each concentration, students must complete a minimum of 6 units at the 500 level. Students completing the International Business or Accounting concentration must complete a minimum of 9 units at the 500 level. Note: The accounting concentration electives must cover the following areas: Financial Accounting and Theory, Accounting Information Systems, Auditing and Taxation.

Capstone Course (3 units)

BUAD 591 Business Strategy Capstone (3)

Students must pass the individual project in BUAD 591 and complete the course with a grade of "B" (3.0) or better. In exceptional cases, a thesis (BUAD 598, Thesis) may serve as an option. See the graduate adviser for details.

BUSINESS ADMINISTRATION COURSES

Courses are designated as BUAD in the class schedule.

201 Business Writing (3)

Prerequisite: ENGL 101 or equivalent (with a grade of "C" (2.0) or better). Core communication practices: routing business correspondence, positive, informative, negative, persuasive messages. Introduction to research and job application process.

210 Understanding Business (3)

Nature, dimensions and forms of business and the role of entrepreneurship in business creation and growth. Development of an understanding of contemporary business issues, including an introduction to major business functions.

301 Advanced Business Communication (3)

Prerequisites: ENGL 101, BUAD 201 and ISDS 265 (or equivalent) with a "C" (2.0) or better. Advanced course in business communication focusing on case analysis, analytical reports, ethics and business presentations.

495 Internship (1-3)

Prerequisites: junior standing, major in Business Administration, consent of the instructor, 2.5 GPA and semester in residence at the university. Planned and supervised work experience. May be repeated for a total of six units of credit. Credit/No Credit grading only.

499 Independent Study (1-3)

Prerequisite: consent of instructor. Open to qualified students desiring to pursue directed independent inquiry. May be repeated for credit. Not open to students on academic probation.

501 Managerial Communications (3)

Investigates the entire process of case studies and formal reports. Students analyze management communication problems, apply writing strategies and deliver executive presentations. May be taken credit/no credit or for a letter grade.

591 Business Strategy Capstone (3)

Prerequisites: classified MCBE status, within six units of completion of study plan and in final semester of program. Tools of strategic management and their application in a business environment. Integrates business functional areas and tools by means of a business consulting project. Fulfills the terminal requirement for the MBA degree.

598 Thesis (3)

Prerequisites: classified MCBE status and consent of the associate dean. Individual research under supervision. See “Theses and Projects” in this catalog for university requirements.

Chemistry/Biochemistry

College of Natural Sciences and Mathematics

INTRODUCTION

The Department of Chemistry and Biochemistry plans its curriculum to provide thorough instruction in the basic principles and concepts of chemistry and biochemistry for students who will (1) advance to graduate work in chemistry or biochemistry; (2) teach in the science programs of secondary schools; (3) seek employment in industry or government; (4) advance to medical, dental, or pharmacy training or (5) pursue a degree or minor in support of a career in other areas such as physics, biology, geology, business or computer science.

To qualify for any of the bachelor's degrees, a student must earn a "C" (2.0) grade or better in all courses required for the major, including prerequisites in related sciences or mathematics.

The Department of Chemistry and Biochemistry is currently on the approved list of The American Chemical Society (ACS), and students have the opportunity to earn ACS certification of the B.S. degrees offered.

LEARNING GOALS AND STUDENT LEARNING OUTCOMES

The following goals and learning outcomes have been established for students pursuing a degree in chemistry or biochemistry:

Concepts

- Understand the concept that all matter is composed of atoms whose inherent periodic properties determine their interactions and combinations into compounds with specific molecular structure, chemical function and physical properties
- Understand and apply fundamental thermodynamic laws and kinetics to chemical reactions in equilibrium and nonequilibrium systems
- Demonstrate literacy in concepts underlying fundamental analytical instrumentation and instrumentation techniques used in chemistry and biochemistry
- Understand the various ways that chemists represent and test chemical knowledge in models, theories, mathematical relationships and symbolic notations
- Understand the principles of safe practices in the laboratory across the subdisciplines of the chemical sciences

Skills and processes

- Demonstrate the ability to generate data and information through designing and safely implementing experiments using contemporary methods and techniques
- Collect, analyze and interpret data and information
- Retrieve appropriate scientific literature and data
- Communicate data, concepts, skills and processes to experts and nonexperts in the field

DEPARTMENT CHAIR

Christopher R. Meyer

DEPARTMENT OFFICE/WEBSITE

McCarthy Hall 580

657-278-3621

<http://chemistry.fullerton.edu>

PROGRAMS OFFERED

Bachelor of Science in Biochemistry
Bachelor of Science in Chemistry
Bachelor of Arts in Chemistry
Minor in Chemistry
Minor in Biotechnology
 Emphasis in Biotechnology
 Emphasis in Environmental Chemistry
Master of Science in Chemistry
 Emphasis in Geochemistry
Single Subject Teaching Credential
 in Science

FACULTY

Peter de Lijser, Richard Deming,
Mark Filowitz, Barbara Gonzalez,
Christina Goode, A. Scott Hewitt,
Paula Hudson, Christopher Hyland,
Philip Janowicz, Katherine Kantardjieff,
Zhuangjie Li, Maria Linder, Christopher
Meyer, Madeline Rasche, Harold Rogers,
Nicholas Salzameda, Chandra
Srinivasan, Fu-Ming Tao

Attitudes

- Demonstrate the safe and ethical use of scientific knowledge, materials and procedures, and be able to explain their impact on a diverse society
- Deliberately employ methods of scientific inquiry to collect, analyze and interpret evidence to solve problems while recognizing the tentative nature of scientific knowledge
- Work effectively, independently and cooperatively
- Pursue career objectives that make use of the baccalaureate degree

Recommended Program in General Education

Because of high unit requirements for chemistry degree programs, students majoring in chemistry are strongly urged to consult with an adviser at the Academic Advisement Center in UH-123 prior to designing their general education programs. There is a six-unit exemption in general education for B.S. Chemistry degree majors for which the undergraduate Chemistry adviser must be consulted.

Upper-Division Baccalaureate Writing Requirement

Chemistry and biochemistry majors meet the coursework portion of the university's upper-division writing requirement by passing ENGL 301 or 360 with a grade of "C" or better.

TEACHING CREDENTIAL

The Bachelor's Degree in Chemistry may be effectively combined with subject matter studies necessary for the Single Subject Teaching Credential in science. Undergraduates are encouraged to contact the Center for Careers in Teaching (657-278-7130, www.fullerton.edu/cct) and the Science Education Programs Office (657-278-2307, <http://nsm.fullerton.edu/scied/>) for early advisement and to plan efficient course selections for general education, the major and credential program coursework. Postbaccalaureate and graduate students should contact the Science Education Programs Office (657-278-2307 or <http://nsm.fullerton.edu/scied/>). Additional information is found under Science Education Programs in the University Catalog as well as at <http://mast.wikispaces.com>.

BACHELOR OF SCIENCE IN BIOCHEMISTRY (120 UNITS)

Students who complete the Bachelor of Science degree in Biochemistry and include CHEM 325 and 411 may qualify for certification by the American Chemical Society.

Basic Courses (48 units)

- CHEM 120A,B General Chemistry (10)
CHEM 210 Computational Tools for Chemical Sciences (1)*
CHEM 301A,B Organic Chemistry (6)
CHEM 302 Organic Chemistry Laboratory (2)
OR CHEM 306A Organic Chemistry Laboratory (2)
CHEM 315 Theory of Quantitative Chemistry (3)
CHEM 316 Quantitative Chemistry Laboratory (1)

- ENGL 301 Advanced College Writing (3)
OR ENGL 360 Scientific and Technical Writing (3)
CHEM 361A,B Introduction to Physical Chemistry (6)
OR CHEM 371A,B Physical Chemistry (6)
CHEM 390 Career Options in Chemistry and Biochemistry (1)
CHEM 410A Introduction to Computational Genomics (1)
CHEM 423A,B General Biochemistry (6)
CHEM 422 Biochemistry Laboratory (2)
CHEM 495/499 Senior Research/Independent Study (3)†
Upper-division elective (3)

* Students who pass MATH 250A are exempt from CHEM 210

† With consent of the department, this may be substituted with CHEM 490 or another course that includes a substantial research component with products that include a poster and paper. Consult the department chair for more information.

Related Courses (26 units)

- PHYS 211, 212, 211L, 212L
MATH 150A,B
BIOL 172, 273

Upper-division electives are encouraged. See the department handbook or the department adviser for the approved list of courses.

BACHELOR OF SCIENCE IN CHEMISTRY (120 UNITS)

Students who complete the Bachelor of Science degree in Chemistry and include an advanced course in instrumental analysis (such as 3 units of CHEM 411) and CHEM 425 may qualify for degree certification by the American Chemical Society.

Basic Courses (48 units)

- CHEM 120A,B General Chemistry (10)
CHEM 210 Computational Tools for Chemical Sciences (1)*
OR (for students electing Environmental Chemistry Emphasis)
MATH 338 Statistics Applied to Natural Sciences (4)
CHEM 301A,B Organic Chemistry (6)
CHEM 306A,B Organic Chemistry Laboratory (4)
CHEM 315 Theory of Quantitative Chemistry (3)
CHEM 316 Quantitative Chemistry Laboratory (1)
CHEM 325 Inorganic Chemistry (3)
ENGL 301 Advanced College Writing (3)
OR ENGL 360 Scientific and Technical Writing (3)
CHEM 355 Physical Chemistry Laboratory (3)
CHEM 371A,B Physical Chemistry (6)
CHEM 390 Careers in Chemistry and Biochemistry (1)
CHEM 410C Introduction to Computational Chemistry (1)

CHEM 495/499 Senior Research/Independent Study (3)†
Upper-division elective (3)

*Students who pass Multivariable Calculus (MATH 250A, 4 units) are exempt from CHEM 210

† With consent of the department, this may be substituted with CHEM 490 or another course that includes a substantial research component with products that include a poster and paper. Consult the department chair for more information

Related Courses (25 units)

PHYS 225, 226, 227, 225L, 226L

MATH 150A,B, 250A, 250B

Note: For students planning to pursue a graduate degree, PHYS 227L is highly recommended.

Career Breadth (9)

Career Breadth requirements are satisfied by taking nine units of upper-division coursework directly related to the student's career plans in chemistry and approved by the undergraduate adviser.

BACHELOR OF ARTS IN CHEMISTRY (120 UNITS)

The Bachelor of Arts in Chemistry degree is offered for students who are planning careers that require a sound background in fundamental chemistry, but not at the depth of the B.S. degree.

Basic Courses (45 units)

CHEM 120A,B General Chemistry (10)

CHEM 210 Computational Tools for Chemical Sciences (1)*

CHEM 301A,B Organic Chemistry (6)

CHEM 306 A,B Organic Chemistry Laboratory (4)

CHEM 315 Theory of Quantitative Chemistry (3)

CHEM 316 Quantitative Chemistry Laboratory (1)

CHEM 325 Inorganic Chemistry (3)

ENGL 301 Advanced College Writing (3)

OR ENGL 360 Scientific and Technical Writing (3)

CHEM 361A, B Introduction to Physical Chemistry (6)

CHEM 390 Career Options in Chemistry (1)

CHEM 410C Introduction to Computational Chemistry (1)

CHEM 411 A,B,C or G Instrumental Analysis (1)

CHEM 421 Biological Chemistry (3)

CHEM 495/499 Senior Research/Independent Study (2)†

*Students who pass Multivariable Calculus (MATH 250A, 4 units) are exempt from CHEM 210

† With consent of the department, this may be substituted with CHEM 490 or another course that includes a substantial research component with products that include a poster and paper. Consult the department chair for more information

Related Courses (16 units)

PHYS 211, 212, 211L, 212L

MATH 150A,B

Chemistry/Pre MBA Program

A student may combine a B.A. in chemistry with a minor in Business Administration to qualify to enroll in and complete an MBA degree at CSUF in one additional year (33 units), provided all entrance requirements for the MBA program have been met. See your department adviser for details.

MINOR IN CHEMISTRY (24 UNITS)

The Minor in Chemistry includes general chemistry plus 14 units of upper-division chemistry courses. These courses must be completed with an overall grade-point average of 2.0. A list of approved upper-division chemistry classes is available from the department office.

EMPHASIS IN BIOTECHNOLOGY

Required Courses (12 units)

CHEM 472A,B Advances in Biotechnology Lab (6)

CHEM 477 Advances in Biotechnology (3)*

BIOL 412 Principles of Gene Manipulation (3)

* May be substituted with any of the following: CHEM 473, BIOL 414, 448

EMPHASIS IN ENVIRONMENTAL CHEMISTRY

Requirements (18-19 units)

Three of the following (9 units):

CHEM 435 Chemistry of Hazardous Materials (3)

CHEM 436 Atmospheric Chemistry (3)

CHEM 437 Environmental Water Chemistry (3)

CHEM 438 Environmental Biochemistry (3)

Three one-unit mini-courses (3 units):

CHEM 411A Optical Spectroscopy (1)

CHEM 411C Separations (1)

CHEM 411G Mass Spectrometry (1)

MATH 338 Statistics Applied to the Natural Sciences (4 units)

Note: This course can be substituted for chemical and biochemical computation courses in meeting requirements for the major.

CHEM 495 (2-3 units)

Note: Topic must be environmentally related.

The Environmental Chemistry Emphasis may be integrated with the B.S. in Chemistry by using the above courses to meet career breadth, elective, computation and research requirements. The environmental chemistry courses also can be used to satisfy requirements for the minor in chemistry.

REQUIREMENTS FOR CHEMISTRY MAJORS SEEKING A TEACHING CREDENTIAL

To qualify for the Subject Matter Preparation Program for the Single Subject Teaching Credential in Science with a concentration in Chemistry, students must earn a bachelor's degree and complete the following:

- BIOL 171
- GEOL 101, 101L and 420 and/or
- Pass California Subject Examinations – (CSET) exams Science Subtest I (astronomy, geology, Earth sciences, and physics), Science Subtest II (biology and chemistry), and Science Subtest III (chemistry). Consult the Secondary Science Education Credential adviser at 657-278-5637 for more information

MASTER OF SCIENCE IN CHEMISTRY (30 UNITS)

Admission

Students must meet the university requirements for admittance to the university. This normally requires a baccalaureate degree from an accredited institution and a grade-point average of at least 2.5 (See the section of this catalog on Graduate Admissions for details). In addition to university requirements, a student must meet the following requirements:

- An undergraduate degree in chemistry or a selection of science courses deemed as adequate preparation for further study in chemistry by the Department Graduate Committee
- At least a 2.75 GPA in science courses
- For students holding undergraduate degrees from non-U.S.-accredited institutions, the GRE subject examination (Chemistry or Biochemistry), with scores reported to the department

Placement Examinations

All incoming students are required to pass an analytical writing exam. Any student failing to pass will be required to take a remedial writing class. Each student is required to take and pass placement examinations or take and pass the appropriate courses with a grade of "B" (3.0) or better. Graduate students in one of the chemistry options must demonstrate competency by passing four placement examinations in the following five areas of chemistry: analytical, inorganic, organic, physical, and/or biochemistry. Graduate students in the biochemistry option must demonstrate competency in the following areas of chemistry: analytical, organic, biochemistry, as well as either physical or biology.

A student may take each placement examination two times within the first year of enrolling in the graduate program. A student who does not pass the placement examinations within the first year must demonstrate competency by passing with a grade of "B" (3.0) or better the appropriate courses within two years after first enrolling.

The appropriate courses are CHEM 301B for organic, 315 for analytical, 325 for inorganic, 361A,B for physical (biochemistry option), 371A,B for physical (chemistry option), 423A,B for biochemistry and BIOL 273 for biology.

Classified Standing

In order to proceed from conditionally classified to classified standing, a student must meet the following requirements:

- Demonstration of competency in any three of the areas, as described above
- Approved selection of a research director
- An approved study plan
- The university graduate-level writing requirement

Study Plan

Three alternatives are available for the study plan. The student can complete either a laboratory thesis (strongly preferred) a library thesis, or project.

The degree program consists of graduate committee-approved coursework completed with a minimum GPA of 3.0 in all coursework exclusive of CHEM 505A,B and 599. Each student prepares a study plan in consultation with the graduate program adviser, which must be approved by the student's research director, the department, and the Office of Graduate Studies. All chemistry courses on the study plan must be 400 level or above.

Study plans may contain no more than 2 units of CHEM 505A,B, and no more than 6 units of CHEM 599 (3 units for students electing the library thesis alternative).

Basic requirements

Courses required of all students:

CHEM 505A,B Seminar (2)

CHEM 599 Independent Graduate Research (3-6)

CHEM 598 Thesis (2-4)

OR CHEM 597 Project (2-4)

Core and Elective Requirements

A minimum of 18 units of adviser-approved coursework are required, at least nine units of which must be the 500 level. Nine of these units must be core courses in the student's area of specialization, as follows:

Analytical – CHEM 511, 512, 552

Biochemistry – CHEM 541, 542, 546

Inorganic – CHEM 425, 431, 552

Organic – CHEM 431, 535, 539

Physical – CHEM 512, 551, 552

A specialization in geochemistry is also available. Consult the chemistry graduate adviser for more information. For further details or advisement concerning the M.S. program, contact the graduate adviser.

MASTER OF ARTS IN CHEMISTRY (30 UNITS)

This course-based degree is intended for those interested in high school or community college teaching, technical librarianship, scientific writing, or who have significant research experience and are currently employed in the industrial sector. See http://chemsvr2.fullerton.edu/MACChem_Overview.asp and the Graduate Program Advisor for details.

CHEMISTRY AND BIOCHEMISTRY COURSES

Courses are designated as CHEM in the class schedule.

100 Survey of Chemistry (3)

Prerequisite: one year of high school algebra. Fundamental principles of chemistry; atomic and molecular structure and the application of these principles to contemporary problems. For nonscience majors.

100L Survey of Chemistry Laboratory (1)

Pre- or corequisite: CHEM 100 or 115. Experiments chosen to develop laboratory techniques; chemical principles and their application to environmental and societal problems. (3 hours laboratory)

102 Physical Science for Future Elementary Teachers (3)

(Same as PHYS 102)

105 Survey of the Molecules of Life (3)

Introduction to the biochemical processes of life, including metabolism, development and disease. Recent scientific advances are discussed with emphasis on AIDS, cancer, diabetes and cloning. Scientific methods and ethical issues in scientific research are examined.

111 Nutrition and Health (3)

Basics of nutrition; diet, food additives, vitamins, hormones, drugs, disease and related biochemical topics. Current controversies, popular practices, fads and fallacies. For non-science majors.

115 Introductory General Chemistry (4)

Chemistry at the basic level. For students with limited background in chemistry who plan to take additional chemistry or other science courses. Does not fulfill chemistry requirements for majors or minors in the physical or biological sciences (3 hours lecture, 2 hours activity)

120A General Chemistry (5)

Prerequisites: passage of the chemistry placement examination and exemption from or passage of the ELM examination or completion of CHEM 115 with a grade of "C" (2.0) or better. For majors and minors in the physical and biological sciences Principles of chemistry: stoichiometry, acids, bases, redox reactions, gas laws, solid and liquid states, changes of state, modern atomic concepts, periodicity and chemical bonding. Laboratory: elementary syntheses, spectroscopy and volumetric quantitative analysis. (3 hours lecture, 3 hours laboratory, 2 hours activity)

120B General Chemistry (5)

Prerequisite: CHEM 120A or its equivalent. For majors and minors in the physical and biological sciences, chemical thermodynamics, chemical equilibrium (gaseous, aqueous, acid-base, solubility and complexation), elementary electrochemistry and chemical kinetics. Laboratory: quantitative and qualitative analysis and elementary physical chemistry; some qualitative analysis. (3 hours lecture, 6 hours laboratory).

125 General Chemistry for Engineers (3)

Prerequisite: CHEM 120A. Topics are same as CHEM 120B but without laboratory. Not open to students with credit in CHEM 120B.

200 Chemistry for Nursing and Allied Health Professionals (5)

Prerequisites: Intermediate algebra with a grade of "C" (2.0) or better. One year of high school chemistry or a passing score on the placement test for general chemistry or completion of introductory general chemistry (CHEM 115 or equivalent) with a "C" (2.0) or better strongly advised. Fundamental concepts of general, organic and biochemistry and their applications to the health sciences. Meets requirement for pre-nursing curriculum and can be applied to other allied health majors. (3 hours lecture, 3 hours activity)

210 Computational Tools for Chemical Sciences (1)

Prerequisites: CHEM 120A,B and a major in chemistry or biochemistry. Use of spreadsheets and higher level programming languages and molecular modeling for chemical problem solving and data management. Chemical algorithms; data analysis and interpretation; graphical preparation and analysis; search/retrieval of chemical data and literature; file transfers between programs and operating systems.

295 Directed Study (1)

Prerequisite: consent of instructor. Research in chemistry under the supervision of a chemistry department faculty member. Credit/no credit only. May be repeated for credit. Does not count towards major. (3 hours laboratory per unit)

301A Organic Chemistry (3)

Prerequisites: CHEM 120A,B. Properties and reactions of aliphatic and aromatic compounds, theories of structure, and reaction mechanisms. For nonchemistry majors, or B.A. in Chemistry, B.S. in Chemistry or B.S. in Biochemistry majors.

301B Organic Chemistry (3)

Prerequisites: CHEM 120A,B, 301A. Properties and reactions of aliphatic and aromatic compounds, theories of structure, and reaction mechanisms. For nonchemistry majors, or B.A. in Chemistry, B.S. in Chemistry or B.S. in Biochemistry majors.

302 Organic Chemistry Laboratory (2)

Prerequisite: CHEM 301A. Corequisite: CHEM 301B. Techniques for the synthesis, characterization and isolation of typical aliphatic and aromatic compounds. For the nonchemistry majors or B.S. in Biochemistry majors. (6 hours laboratory)

302A Organic Chemistry Laboratory (1)

Corequisite : CHEM 301A. Techniques for the synthesis, isolation and characterization of typical aliphatic and aromatic compounds. Students wishing to fulfill all of their organic chemistry laboratory requirements in a single semester should enroll in CHEM 302.

302B Organic Chemistry Laboratory (1)

Corequisite: CHEM 301B. Techniques for the synthesis, isolation and characterization of typical aliphatic and aromatic compounds. Students wishing to fulfill all of their organic chemistry laboratory requirements in a single semester should enroll in CHEM 302.

303A Biotechnology: Business and Society (1)

Prerequisites: completion of General Education (G.E.) Categories A, B, B.1, B.4. Major applications of modern biotechnology will be explored in a lecture/discussion/presentation format that includes guest speakers from industry. (3 hours lecture/discussion for 5 weeks)

303B Biotechnology: Medical Biotechnology (1)

Prerequisites: CHEM 303A and completion of G.E. Categories A, B, B.1, B.4. Major applications of modern biotechnology will be explored in a lecture/discussion/presentation format that includes guest speakers from industry. (3 hours lecture/discussion for 5 weeks)

303C Biotechnology: Agricultural and Environmental Biotechnology (1)

Prerequisites: CHEM 303A and completion of G.E. Categories A, B, B.1, B.4. Major applications of modern biotechnology will be explored in a lecture/discussion/presentation format that includes guest speakers from industry. (3 hours lecture/discussion for 5 weeks)

306A Organic Chemistry Laboratory (2)

Prerequisites: CHEM 120 A,B. Corequisite: CHEM 301A. Techniques for synthesis, isolation and characterization of typical aliphatic and aromatic compounds, with applications of instrumental and spectroscopic methods for B.A. and B.S. in Chemistry majors. (6 hours laboratory)

306B Organic Chemistry Laboratory (2)

Prerequisites: CHEM 301A, 306A. Corequisite: CHEM 301B. Continuation of CHEM 306A for B.A. and B.S. in Chemistry majors. (6 hours laboratory)

311 Nutrition and Disease (3)

Prerequisite: CHEM 111 or BIOL 101. Relationship between nutrients and disease, emphasizing cancer, atherosclerosis and infectious illness. Dietary factors that modify and/or contribute to the disease process from the viewpoints of physiology, biochemistry and immunology. Not applicable to the major. (Same as BIOL 311)

313A Environmental Pollution and Its Solutions: Air Pollution (1)

Prerequisites: completion of G.E. Categories A, B, B.3. Human pollution of the Earth's atmosphere and means to ameliorate this pollution. Historical examples, current cases and future prospects. (3 hours lecture/discussion for 5 weeks)

313B Environmental Pollution and Its Solutions: Water Pollution (1)

Prerequisites: completion of G.E. Categories A, B, B.3. Human pollution of the Earth's aqueous environment and means to ameliorate this pollution. Historical examples, current cases and future prospects. (3 hours lecture/discussion for 5 weeks)

313C Environmental Pollution and Its Solutions: Land Pollution (1)

Prerequisites: completion of G.E. Categories A, B, B.3. Human pollution of the Earth's terrestrial environment and means to ameliorate this pollution. Historical examples, current cases and future prospects. (3 hours lecture/discussion for 5 weeks)

315 Theory of Quantitative Chemistry (3)

Prerequisite: CHEM 120B. PHYS 211, 212 or 225. PHYS 226 strongly recommended. Modern analytical chemistry; aqueous and non-aqueous equilibrium calculations, electrochemistry, spectrometry, and contemporary separation methods emphasizing chromatography.

315W Quantitative Chemistry Workshop (1)

Corequisite: CHEM 315. Designed to enhance knowledge and skills needed for success in CHEM 315. Review general chemistry, problem-solving skills, study and exam skills, and their application to quantitative chemistry. Credit/No Credit only. (2 hours activity)

316 Quantitative Chemistry Laboratory (1)

Prerequisites: CHEM 315, 210. Modern analytical chemistry laboratory: polyprotic acids, liquid chromatography, electrochemistry, absorption spectroscopy (ultraviolet/visible, infrared, atomic). (3 hours laboratory)

325 Inorganic Chemistry (3)

Prerequisite: CHEM 301B. Chemistry of the main group elements and an introduction to transition metal chemistry.

355 Physical Chemistry Laboratory (3)

Prerequisite: CHEM 316, 361A or 371A. Corequisite: CHEM 361B or 371B. Experiments in chemical synthesis, instrumental analysis and physical chemistry. Laboratory training and written presentation of theory, data and results are emphasized. (1 hour lecture, 6 hours laboratory).

361A Introduction to Physical Chemistry (3)

Prerequisites: MATH 150A,B and PHYS 211, 212 or 225, 226, CHEM 301A,B. Thermodynamics and kinetics; properties of gases and solutions; molecular structure and energies and application to spectroscopic techniques; liquids, phase equilibria, thermodynamics of multicomponent systems with application to the life sciences.

361B Introduction to Physical Chemistry (3)

Prerequisites: MATH 150A,B and PHYS 211, 212 or 225, 226, CHEM 301A,B. Thermodynamics and kinetics; properties of gases and solutions; molecular structure and energies and application to spectroscopic techniques; liquids, phase equilibria, thermodynamics of multicomponent systems with application to the life sciences.

371A Physical Chemistry (3)

Prerequisites: MATH 250A, PHYS 225, 226, CHEM 301A,B. Thermodynamics, solutions, chemical and phase equilibria, electrochemistry, transport phenomena, introduction to atomic and molecular structure, rotation and vibration spectroscopy, statistical mechanics, and kinetics.

371B Physical Chemistry (3)

Prerequisites: MATH 250A, PHYS 225, 226, CHEM 301A,B. Thermodynamics, solutions, chemical and phase equilibria, electrochemistry, transport phenomena, introduction to atomic and molecular structure, rotation and vibration spectroscopy, statistical mechanics, and kinetics.

390 Careers in Chemistry and Biochemistry (1)

Prerequisite: CHEM 120B. Career options in chemistry. Credit/No Credit only.

395 Undergraduate Research (1-3)

Prerequisites: completion of one upper-division course in chemistry, one semester of experience working in a research laboratory, and consent of instructor. Independent research in chemistry or biochemistry under the guidance of a department faculty member. May be repeated for credit. Does not count towards major. (3 hours per week per unit). (4 units maximum)

410A Introduction to Computational Genomics (1)

Prerequisites: CHEM 361A; 421 or 423A; 210. Corequisite, 361B, 371B or 423B. Protein and DNA sequence analysis and molecular evolution; probabilistic models of sequences; gene identification; comparative genomics (algorithms and statistics); brief review of structure and evolution of genes and proteins.

410B Advanced Computational Biochemistry (1)

Prerequisites: CHEM 361A; 421 or 423A; 210. Corequisite, 361B or 371B or 423B. Principles of protein folding and structure; methods for determining protein structure; methods of protein structure prediction and modeling; contents of structural databases; structure visualization, validation and analysis; structure-based drug design; rational mutagenesis; computational biochemistry tools.

410C Introduction to Computational Chemistry (1)

Prerequisites: CHEM 361A or 371A; 210. Corequisite, 361B or 371B. Basic theory of molecular electronic structure; common methods for molecular computation; visualizing molecular structure and understanding calculated properties; predicting molecular spectra and other experimental data; applying molecular computation to practical problems in research.

410D Advanced Computational Chemistry (1)

Prerequisites: CHEM 361A or 371A; 210; 410C. Corequisite, 361B or 371B. High-level methods of molecular computation; theory of reaction rates; methods for transition state computations; tools and techniques for exploring reaction mechanisms or pathways; prediction of reaction kinetics data; applications of molecular computations in research.

411A Instrumental Analysis - Optical Spectroscopy (1)

Prerequisites: CHEM 315, 316. Corequisite: CHEM 361B or 371B. UV/visible, infrared, atomic absorption, flame emission. Students wishing an ACS certified degree must take three units of CHEM 411 courses. (1 hour lecture, 3 hours laboratory for 5 weeks)

411B Instrumental Analysis - Magnetic Resonance (1)

Prerequisites: CHEM 315, 316. Nuclear magnetic resonance, electron spin resonance. Students wishing an ACS certified degree must take three units of CHEM 411 courses. (1 hour lecture, 3 hours laboratory for 5 weeks)

411C Instrumental Analysis - Separations (1)

Prerequisites: CHEM 315, 316. High performance liquid chromatography, gas chromatography. Students wishing an ACS certified degree must take three units of CHEM 411 courses. (1 hour lecture, 3 hours laboratory for 5 weeks)

411G Instrumental Analysis - Mass spectrometry (1)

Prerequisites: CHEM 315, 316. Conventional magnetic sector, quadruple, Fourier transform, tandem, and time-of-flight; hyphenated techniques including gas chromatography (GC-MS), liquid chromatography (LC-MS). Students wishing an ACS certified degree must take three units of CHEM 411 courses. (1 hour lecture, 3 hours laboratory for 5 weeks)

421 Biological Chemistry (3)

Prerequisite: CHEM 301A. Corequisite: CHEM 315. Biochemistry designed for biology majors and pre-health profession careers. Intermediary metabolism and compounds of biochemical interest. Application of biochemistry and the biochemical foundation of health science.

422 General Biochemistry Laboratory (2)

Prerequisites: CHEM 302 or 306A and 316. Corequisite: CHEM 421 or 423A. Chemistry and metabolism of carbohydrates, nucleic acids, lipids and proteins; techniques of enzyme isolation and characterization; DNA isolation and manipulation; research methods. (6 hours laboratory)

423A General Biochemistry (3)

Prerequisite: CHEM 301B. Corequisite: CHEM 315. For Biochemistry majors; structural chemistry and function of biomolecules, bioenergetics and intermediary metabolism.

423B General Biochemistry (3)

Prerequisite: CHEM 423A. For Biochemistry majors; structural chemistry and function of biomolecules, central and secondary metabolism; photosynthesis; nucleic acid biochemistry.

425 Advanced Inorganic Chemistry (3)

Prerequisites: CHEM 325, 361A,B or 371A,B. Bonding, structure and reactivity of transition and lanthanide elements. Molecular orbital and ligand field theory, classical metal complexes and organometallic chemistry of the transition elements.

431 Advanced Organic Chemistry (3)

Prerequisites: CHEM 301B, 361A,B or 371A. Theoretical and physical aspects of organic chemistry. The modern concepts of structure, and reaction mechanisms.

435 Chemistry of Hazardous Materials (3)

Prerequisite: CHEM 301B. Hazardous chemicals; organic and inorganic air- and moisture-sensitive compounds, reactive metals; chemical reactivity patterns; chemical compatibilities; storage and handling; methods of disposal and waste containment; Federal and local regulations; case histories.

436 Atmospheric Chemistry (3)

Prerequisite: CHEM 315. Chemistry and photochemistry of the troposphere and stratosphere, both natural and polluted. Fundamental reaction kinetics and mechanisms, monitoring techniques, smog chamber, field and modeling studies.

437 Environmental Water Chemistry (3)

Prerequisite: CHEM 315. Chemical characteristics of fresh and oceanic water; major water pollutant classes, origins, environmental chemical transformations, effects, abatement, and fates; chemical methods for determining water quality, large scale processes for water treatment.

438 Environmental Biochemistry (3)

Prerequisite: CHEM 301B. Effects of current agricultural, industrial and mechanical practices on the composition, metabolism and health of soil, plants, animals and man, from a biochemical perspective; mechanism of action and degradation of common agricultural chemicals and industrial pollutants.

445 Nutritional Biochemistry (3)

Prerequisite: CHEM 423A or 421. Nutrition, metabolism and excretion of carbohydrates, proteins, fats, vitamins, major minerals and trace elements from a biochemical perspective. Relevant variations in dietary practices related to life stages and specific illnesses.

472A Advances in Biotechnology Lab (3)

(Same as BIOL 472A)

472B Advances in Biotechnology Laboratory (3)

Prerequisite: BIOL/CHEM 472A. Biotechnology techniques for gene product analysis: DNA sequencing, site-directed mutagenesis, predicting amino acid changes, protein overproduction, enzyme function assays, protein identification/preparation by gel techniques, immunoblotting. (1 hour discussion, 6 hours laboratory) (Same as BIOL 472B)

473 Introduction to Bioinformatics (3)

(Same as BIOL 473)

477 Advances in Biotechnology (3)

Prerequisites: BIOL 172, 273. Corequisite: CHEM 421 or 423B. Current topics in biotechnology centering on techniques for molecular cloning and DNA sequencing of genes. Medical breakthroughs for diagnosis of mutations and gene therapy. Role of biotechnology in agriculture, energy and environment. Bioethical issues. (Same as BIOL 477)

480A Topics in Contemporary Chemistry (1)

Prerequisite: junior or senior standing in chemistry. Research seminar dealing with topics of current interest in chemistry such as photochemistry, biochemistry, analytical chemistry and organometallic chemistry. Credit/no credit only. Not applicable toward master's degree. May be repeated for credit.

480M MARC Proseminar (1)

(Same as BIOL and PSYC 480M)

480S Howard Hughes Medical Institute Scholars Proseminar (1)

Prerequisite: Selection as Howard Hughes Medical Institute (HHMI) Undergraduate Research Scholar. Hands-on training and experience in practices required for becoming a biomedical research scientist and entering doctoral programs; includes familiarity with the scientific literature and interactions with visiting scientists. May be repeated for up to four units.

480T Topics in Contemporary Chemistry (2-3)

Prerequisite: junior or senior standing in chemistry. Special lecture topics of current interest in chemistry. May be repeated for credit. (1 hour lecture per unit)

490 Internship in Chemistry and Biochemistry (1-2)

Prerequisites: junior or senior standing in chemistry and consent of instructor. Internship in chemistry. Work on projects in industrial, governmental or medical laboratories. May count as career breadth requirement units for chemistry majors, or substituted for CHEM 495, with permission. May be repeated once. Does not count toward M.S. degree.

495 Senior Research (1-3)

Prerequisites: three one-year courses in chemistry, CHEM 390 and consent of instructor. Corequisite: ENGL 301 or 360. Methods of chemical research through a research project under the supervision of one of the department faculty. May be repeated for credit. Only 6 units may apply toward B.A. or B.S. degree (6 hours per week per unit)

496 Student-to-Student Tutorials (1-3)

Supervised experience in chemistry teaching through tutoring or assisting in laboratory or field classes. Consult "Student-to-Student Tutorials" in this catalog for prerequisites and a more complete course description.

498 Senior Thesis (2)

(Same as BIOL 498)

499 Independent Study (1-3)

Prerequisites: junior or senior standing and completion of two one-year courses in chemistry. Special topics in chemistry selected in consultation with the instructor and approval of department chair. May be repeated for credit. Only six units may apply toward B.A. or B.S. degree. In some cases, CHEM 499 can be substituted for 495 to meet degree requirements.

505A Seminar (Participation) (1)

Prerequisites: graduate standing and consent of department. Student attendance at presentations by invited scientists on topics of current interest in chemistry. May not be repeated for credit. (1 hour seminar)

505B Seminar (Presentation) (1)

Prerequisites: CHEM 505A, graduate standing and consent of the department. Student presentation of recent contributions to the chemical literature. May not be repeated for credit. (1 hour seminar)

511 Theory of Separations (3)

Prerequisites: CHEM 355, 361A,B or 371A,B. Theory, application and limitations of physical and chemical separation techniques; chromatography.

512 Advanced Instrumentation (3)

Prerequisite: CHEM 315. Spectroscopic instrumentation components and systems. Laser spectroscopy, mass spectroscopy, chemical sensor, process control, surface science, and microscopy methods; vacuum technology, optics, electro-optics, and electronics components; design and repair of instrumentation.

535 Organic Synthesis (3)

Prerequisites: CHEM 361A,B or 371A,B, 301B. Methods of synthetic organic chemistry and their application to construction of organic molecules.

537 Organic Spectroscopy (3)

Prerequisites: CHEM 301B/302 or 301B/306B, CHEM 361A,B. CHEM431 recommended. Theory and use of infrared spectroscopy, mass spectrometry, ultraviolet-visible spectroscopy and nuclear magnetic resonance spectroscopy as methods for the identification of organic compounds.

539 Chemistry of Natural Products (3)

Prerequisite: CHEM 301B. Biosynthesis of the alkaloids, terpenes, steroids and other natural products of plant and animal origin.

541 Protein Biochemistry (3)

Prerequisites: CHEM 423A,B or equivalent. Protein isolation strategies and techniques; chemical/physical characterization and modeling; functional characterization (kinetics, binding, chemical modification); molecular biology, including protein expression and engineering.

542 Nucleic Acid Biochemistry (3)

Prerequisites: CHEM 423A,B, or equivalent, and a biochemistry lab course (CHEM 422 or equivalent). Biochemistry of nucleic acids in living systems at the molecular level. Advances and techniques used in nucleic acid research and biotechnology. Strong emphasis on critical reading, analysis and presentation of primary literature.

543 Physical Biochemistry (3)

Prerequisites: CHEM 361A,B or 371A,B, 421 or 423A,B. Methods for measuring physical properties of proteins and nucleic acids. Thermodynamic and hydrodynamic aspects.

546 Metabolism and Catalysis (3)

Prerequisite: CHEM 421 or 423A,B. Regulation of bio-synthetic and degradative reactions in living systems. The control of enzyme activity and concentration. Mechanisms of hormone action.

551 Quantum Chemistry (3)

Prerequisites: CHEM 371A,B. Postulates and theories of approximation methods in quantum chemistry, the electronic structure of atoms and molecules, chemical bonds, group theory and applications.

552 Kinetics and Spectroscopy (3)

Prerequisite: CHEM 361B or 371B. Kinetics and spectroscopy of chemical and biochemical systems in the gas phase, in the liquid phase, and on surfaces.

580T Topics in Advanced Chemistry (1-6)

Prerequisite: graduate standing in chemistry. Current research topics in chemistry in the area of analytical, organic, inorganic, physical chemistry and biochemistry. May be repeated for credit. (1 hour seminar per unit)

597 Project (1-6)

Prerequisites: an officially appointed project committee and consent of the department chair. Guidance in the preparation for a project for the master's degree.

598 Thesis (1-6)

Prerequisite: an officially appointed thesis committee. Guidance in the preparation of a thesis for the master's degree.

599 Independent Graduate Research (1-6)

Prerequisite: graduate standing in chemistry. May be repeated for credit.



Chicana and Chicano Studies

College of Humanities and Social Sciences

DEPARTMENT CHAIR

Alexandro José Gradilla

DEPARTMENT OFFICE/WEBSITE

Humanities 314

657-278-3731

<http://hss.fullerton.edu/chicano>

PROGRAMS OFFERED

Bachelor of Arts in Ethnic Studies

Option in Chicano Studies

Minor in Chicano Studies

FACULTY

Erualdo González, Alexandro José

Gradilla, Patricia Pérez

INTRODUCTION

Chicana and Chicano Studies offers an outstanding interdisciplinary education. The department has developed a challenging curriculum that is especially relevant in our growing multicultural society. Increasingly, public and private employers are recognizing the need for professionals who can relate to Chicano and other Latino populations. The Chicana and Chicano Studies Department takes great pride in preparing graduates who can fulfill these criteria.

Our department offers challenging coursework that explores racial politics, history, education, literature, law and immigration, civil rights, feminism, socio-economics, the Chicana/o family, art, music and film. Particular emphasis is given to other Latino cultures in the United States. Students emerge from this challenging major armed with powerful analytical tools, a strong expertise in subject matter and a newfound appreciation for the complexity of the Chicana/o experience. Frequently, our students conduct important research under the supervision of our superb faculty. Several classes offer student opportunities to internationalize their educational experience. Some seminars also provide students with the chance to strengthen local communities through service-learning internships. Finally, coursework and learning are continually reinforced through technology-based assignments.

Teaching Credential

Because Chicana/o Studies is interdisciplinary, the major provides a particularly appropriate background for elementary school teaching (K-8) and secondary school teaching (7-12). Undergraduate majors are encouraged to work closely with the CSUF Center for Careers in Teaching at 657-278-7130.

LEARNING GOALS AND STUDENT LEARNING OUTCOMES

The following learning goals and learning outcomes have been established for students pursuing a degree in Chicana/o Studies:

Knowledge

- Mastering interdisciplinary perspectives focusing on social sciences, humanities and the arts
- Have a working knowledge of the history of the field of Chicana/o Studies — its theories, methods and intellectual justifications
- Gain knowledge and understanding of the role of critical theory and perspectives to understand phenomena, including issues of race, class, gender and politics

Critical thinking and Expressive Skills

- Develop their research skills and clearly communicate their findings through well-organized written and oral methods of delivery
- Develop critical thinking, writing and interpretive skills

- Understand diverse viewpoints and experiences through group communication and collaborative team work
- Engage technology and multimedia in communicating written and oral research

Civic Engagement and Leadership Skills

- Understand how to bridge academic content and practice through service learning
- Develop an understanding of social justice principles and applying them to make a difference in their local, national and global communities

BACHELOR OF ARTS IN ETHNIC STUDIES (120 UNITS)

The Bachelor of Arts in Ethnic Studies includes courses for the option, general education, all-university requirements and free electives.

OPTION IN CHICANO STUDIES (36 UNITS)

Lower division courses (6 units)

CHIC 106 Introduction to Chicano Studies (3)

CHIC 220 Mexican Heritage (3)

Upper-division courses

Required Courses (9 units), selected from the following:

CHIC 330 The Evolution of Mexican Literature (3)

CHIC 331 The Chicano Child (3)

CHIC 340 Mexican/Chicano Intellectual Thought (3)

CHIC 345 History of the Chicano (3)

CHIC 353 Mexico Since 1906 (3)

Upper-Division Writing Requirement (3 units)

CHIC 307 Research and Writing in Ethnic Studies (3)

OR ENGL 301 Advanced College Writing (3)

Electives (18 units minimum)

Courses to be selected from remaining Chicana/o Studies curriculum, of which only six units maximum of lower-division elective courses may apply.

MINOR IN CHICANO STUDIES (24 UNITS)

Lower-division courses (6 units)

CHIC 106 Introduction to Chicano Studies (3)

CHIC 220 Mexican Heritage (3)

Upper-division courses (9 units)

CHIC 330 The Evolution of Mexican Literature (3)

CHIC 331 The Chicano Child (3)

CHIC 340 Mexican/Chicano Intellectual Thought (3)

CHIC 345 History of the Chicano (3)

CHIC 353 Mexico Since 1906 (3)

Electives

Nine units of approved coursework in lower- and upper-division classes, selected in consultation with the department adviser.

GRADUATE STUDY

The Department of Chicana and Chicano Studies offers courses for advanced study in the following graduate degree programs:

- Master of Science in Education – Bilingual/Bicultural Concentration
- Master of Arts in Spanish – Bilingual Concentration

CHICANA AND CHICANO STUDIES COURSES

Courses are designated as CHIC in the class schedule.

101 Introduction to Ethnic Studies (3)

(Same as AFRO 101)

102 Communication Skills (3)

Basic communication skills, including oral and written expression. A unit on the mechanics of writing and reporting on a term paper is included as part of the course.

106 Introduction to Chicano Studies (3)

Prerequisite: completion of General Education (G.E.) Category D.1. Role of the Chicano in the United States. The Chicano's cultural values, social organization, urbanization patterns, and the problems in the areas of education, politics and legislation. One or more sections offered online.

108 Linguistics and Minority Dialects (3)

(Same as LING 108)

190 Survey of American History with Emphasis on Ethnic Minorities (3)

(Same as HIST/AFRO 190. Fulfills Title V, Statutory Requirements)

220 Mexican Heritage (3)

Basic characteristics of the Mexican, especially the Chicano, society and culture from 1519 to present. Arts, literature and history of Mexico and the Chicano in the United States.

302 Ancient Mexican Culture (3)

Historical and cultural survey of principal pre-Columbian cultures of Mexico and their significance to Mexican society.

303 Cultural Differences in Mexico and the Southwest (3)

Prerequisite: completion of G.E. Category D.1. Cultural conflicts in Mexico and the Southwest as seen by the intellectual thinkers of Mexico and the United States. Urban and rural problems.

304 Music of Mexico (3)

(Same as MUS 304)

305 The Chicano Family (3)

The Chicano family's development as an American social institution. Historical, cross-cultural perspectives, and the social and psychological dynamics of the Chicano family.

306 Barrio Studies (3)

Major characteristics of the barrio. Supervised fieldwork in the barrio is required. Analysis of the barrio or an agency within the barrio will be made after fieldwork is completed. (2 hours lecture, 3 hours fieldwork)

307 Research and Writing in Ethnic Studies (3)

(Same as AFRO/ASAM 307)

313 La Chicana (3)

Prerequisite: completion of G.E. Category D.1. Cultural influences that the family, religion, economic status and community play upon the lifestyles, values and roles held by Chicanas. One or more sections offered online. (Same as WMST 313)

315 Chicano/Latino Theater (3)

Prerequisite: completion of G.E. Category C.1. or C.2. Contemporary Chicano/Latino theater in relation to its historical evolution. Plays, playwrights and theater groups expressing the Chicano/Latino experience. Extensive play reading. (Same as THTR 315)

316 The Chicano Music Experience (3)

Mexican folk and popular music and its relationship to the culture of Mexico. Pre-Cortesian period to the present in Mexico and Southwestern United States.

330 The Evolution of Mexican Literature (3)

Prerequisite: completion of the G.E. Category C.2. Survey and analysis of the Nahautl, Mexican and Chicano literature from pre-Columbian period to present.

331 The Chicano Child (3)

Prerequisite: completion of G.E. Category D.1. The Chicano child from preschool through grade six. Motor, physical, social, intellectual, emotional growth and development and their effect on school adjustment and achievement. Field observation of preschool and grade school children required.

332 The Chicano Adolescent (3)

Prerequisite: completion of the G.E. Category D.1 The Chicano adolescent's social, intellectual and emotional growth and development. Bicultural pressures from the barrio, family structure, school and achievement values.

333 Mexican Literature Since 1940 (3)

Literature of Mexico since 1940: Carlos Fuentes, Rodolfo Usigli, Xavier Villarrutia, Juan Jose Arreola, Octavio Paz, Laura Esquivel and Juan Rulfo. Other contemporary authors may be included.

336 Main Trends in Spanish-American Literature (3)

Main currents of Spanish-American literature emphasizing contemporary works. Relation between the artistic expression and the ideological values of the period.

337 Contemporary Chicano Literature (3)

Prerequisite: CHIC 106 or 220. Modern Chicano writers in the United States: Alurista, Corky Gonzales, Octavio Romano, El Teatro Campesino and major Chicano magazines and newspapers. Other contemporary writers may be included.

340 Mexican/Chicano Intellectual Thought (3)

Prerequisite: completion of G.E. Category C.2. Emergence of the Chicano movement dealing with political, economic and sociological facets. Writings of Nahautl, Spanish, Spanish-American, Chicano and contemporary writers. Not applicable for graduate degree credit.

345 History of the Chicano (3)

Prerequisite: completion of the G.E. Category D.1. History of the Chicano from the pre-Columbian period to the present. The Chicanos' changing role in the United States, their cultural identity crisis and their achievements.

350 Mexican Life and Culture (3)

(Same as LTAM 350)

353 Mexico Since 1906 (3)

Prerequisite: completion of G.E. Category D.1. Mexican Revolution of 1910, stressing the political, economic and social aspects, as well as its contributions in the fields of art, literature and social reforms.

360 Chicanos and the Law (3)

Relationship between Chicanos and the legal and judicial system, including the administration of justice, Chicano-police relations and prison system.

367 Latino/a Spirituality and Religion (3)

(Same as CPRL 367)

450 The Chicano and Contemporary Issues (3)

Socioeconomic and political problems confronting the Chicano, including proposed solutions. Effect that social institutions have had on the Chicano community.

460 The Chicano and Politics (3)

Theory of urban politics and evaluation of issues that affect the Chicanos and American society. Evaluations and surveys will be made on political organizations in Hispanic-surnamed communities. (Same as POSC 460)

480 The Immigrant and the Chicano (3)

Mexican immigration to the United States and its social, economic and political impacts on the Chicano and non-Chicano communities and other immigrant groups.

499 Independent Study (1-3)

Prerequisites: senior standing and approval by the department chair and instructor(s) in charge of directing the study. Opportunity to study independently under the guidance of the faculty on a subject of special interest and approved by instructor.

599 Independent Graduate Research (1-3)

Prerequisites: consent of instructor and classified status. Individual research for Chicana and Chicano Studies components in M.A. in Bilingual Studies (Spanish), M.S. in Bilingual Education (Education) and related programs. Maximum 3 hours credit.



Child and Adolescent Studies

College of Health and Human Development

DEPARTMENT CHAIR

Kari Knutson Miller

DEPARTMENT OFFICE/WEBSITE

Education Classroom 531
657-278-8458
<http://hhd.fullerton.edu/cas>

PROGRAMS OFFERED

Bachelor of Science in Child and Adolescent Development
Options:
Early Childhood Development
Elementary School Settings
Adolescent/Youth Development
Family and Community Contexts
Minor in Child and Adolescent Development

FACULTY

Katherine Bono, Ioakim Boutakidis, Nathalie Carrick, Leslie Grier, Diana Wright Guerin, Leigh Hobson, Janna Kim, Kari Knutson Miller, Pamela Oliver, James Rodriguez, Sharon Seidman, Sharon Willmer, Shelli Wynants, Shu-Chen Yen

INTRODUCTION

The Child and Adolescent Development major is designed to provide students with empirically derived knowledge about bio-physical, socio-emotional, and cognitive developmental milestones and processes; individual differences; and common variations in development. Through coursework and fieldwork experiences, students learn about developmental theory, research and methodologies, discuss relevant professional and ethical standards, and hone their information literacy and research analysis skills. The curriculum provides a foundation for effective work with and advocacy on behalf of children, adolescents and families from diverse backgrounds in a variety of educational and service settings. Graduates of the program have the tools and skills necessary to sustain a lifelong pursuit of developmental inquiry and to foster appropriate and effective responses to changing professional demands.

The Bachelor of Science in Child and Adolescent Development provides broad undergraduate preparation for students interested in elementary education, special education, early care and education, child/adolescent guidance and a variety of youth-related social service careers, as well as graduate study in disciplines such as child development, counseling, developmental psychology and social work.

LEARNING GOALS AND STUDENT LEARNING OUTCOMES

The following goals and learning outcomes have been established for students pursuing a degree in Child and Adolescent Development:

Comprehension of theories, concepts and research findings

- Describe and/or explain relevant theories, concepts and related research findings
- Differentiate typical from atypical development
- Describe individual, cultural and environmental differences
- Identify the purpose and structure of community and government systems

Information literacy and research analysis skills

- Identify, access, analyze and synthesize relevant sources
- Critically analyze research studies

Communication skills

- Write effectively in APA style, taking purpose and audience into account
- Make effective oral presentations, taking purpose and audience into account

Professional, ethical and reflective practice with diverse populations

- Apply theories, concepts and research findings to promote child well-being
- Identify relevant ethical and legal issues and the impact of possible actions in real-world situations

ACADEMIC ADVISEMENT

Academic advisement is provided at both the Fullerton and Irvine campuses through regularly scheduled Overview of the Major sessions and individual student advising appointments. During their first semester as a major, students are required to attend an Overview of the Major session and are expected to consult with a department adviser to develop an academic plan to ensure efficient progress towards graduation. Consult the department website or contact the department office for a schedule of Overview of the Major sessions and available individual advisement appointments.

BACHELOR OF SCIENCE IN CHILD AND ADOLESCENT DEVELOPMENT (51 UNITS)

The Bachelor of Science in Child and Adolescent Development requires a minimum of 51 units in the major, including a nine-unit basic core completed by all majors and 42 units in one of the following four options: Early Childhood Development; Elementary School Settings; Adolescent/Youth Development; and Family and Community Contexts.

A grade of "C" (2.0) or better is required in all courses applied to the major. Course prerequisites are strictly enforced.

Basic Core Courses (9 units)

- CAS 101 Introduction to Child and Adolescent Development (3)
- CAS 201 Child, Family and Community (3)
- SPED 371 Exceptional Individual (3)

OPTION IN EARLY CHILDHOOD DEVELOPMENT (42 UNITS)

The option in Early Childhood Development (ECD) is designed for students pursuing careers working with young children and their families. In keeping with the National Association for the Education of Young Children's professional standards for bachelor's programs and the education requirements of the California Child Development Permit Matrix, the coursework emphasizes children's early development and learning; strategies to engage in developmentally appropriate practices; creation of early childhood environments rich in language, literacy, and other foundational skills; observation and assessment of young children and their environments; and effective work with diverse populations.

Option-Specific Core Courses (18 units)

- CAS 215 Observations in Early Childhood Settings (3)
- CAS 305 Advanced Assessment in Early Childhood (3)
- CAS 321 Infant/Toddler Development (3)
- CAS 322 Preschool-Age Development (3)
- CAS 323 Primary-Age Development (3)
- CAS 491 Leadership Seminar in Early Childhood (3)

Fieldwork Courses (6 units)

- CAS 140/L Introduction to Early Childhood//Practicum (3)
OR CAS394/L Practicum Seminar/Practicum in Child and Adolescent Development (3)
- CAS 464/L Practicum Seminar/Practicum in Early Care and Education (3)

Topical Developmental Courses (18 units)

- CAS 340 Parenting in the 21st Century (3)
OR CAS 341 Working with Parents of Young Children (3)
- CAS 346 Modern Culture and Early Childhood (3)
- NURS 306 Health and Safety for Early Childhood (3)
- SPED 400 Early Childhood Special Education (3)

And one class from each cluster:

- Language and Literacy – CAS 351, READ 340, or SPED 436
- Curriculum – CAS 352, CAS 353, ART 380, BIOL 453, GEOL 410, MUS 433 or approved alternate.

OPTION IN ELEMENTARY SCHOOL SETTINGS (42 UNITS)

The option in Elementary School Settings (ESS) is designed for students interested in teaching at the elementary school level and emphasizes an understanding of cognitive, physical, and socio-emotional development, subject-matter knowledge, and consideration of pedagogical strategies and programs that promote academic achievement as well as other positive developmental outcomes for elementary school children.

Option-Specific Core Courses (18 units)

- CAS 300 Elements of Effective Professional Communication (3)
- CAS 301 Inquiry and Methodology in Development (3)
- CAS 310 Assessing and Observing Development (3)
- CAS 325A Conception through Age 8 (3)
- CAS 325B Age 9 through Adolescence (3)
- CAS 490T Topical Senior Seminar in Child and Adolescent Development (3)

Fieldwork Courses (6 units)

- CAS 394/L Practicum Seminar/Practicum in Child and Adolescent Development (3)
- CAS 474/L Practicum Seminar/Practicum in Development in School Settings (3)

Topical Developmental Courses (18 units)

One class from each cluster:

- Arts – ART 380, DANC 471, MUSC 433, THTR 402A
- Kinesiology – KNES 386
- Language Arts – ENGL 341, THTR 311
- Math – MATH 303A

Science – BIOL 453, GEOL 410

Developmental Elective – CAS 326, CAS 340, CAS 345,
2nd CAS 490T

MULTIPLE SUBJECT TEACHING CREDENTIAL PREPARATION

A Multiple Subject Teaching Credential is required to teach in California public elementary schools. Demonstration of both basic skills and subject matter competency are admission requirements for the Multiple Subject Teaching Credential program. Further information is available from the Center for Careers in Teaching.

OPTION IN ADOLESCENT/YOUTH DEVELOPMENT (42 UNITS)

The option in Adolescent/Youth Development (AYD) provides advanced understanding of cognitive, physical and socio-emotional development during the adolescent age period. It is designed for students who intend to work with youth in community-based settings and/or to pursue graduate studies related to adolescent development.

Option-Specific Core Courses (18 units)

CAS 300 Elements of Effective Professional Communication (3)
CAS 301 Inquiry and Methodology in Development (3)
CAS 310 Assessing and Observing Development (3)
CAS 325A Conception through Age 8 (3)
CAS 325B Age 9 through Adolescence (3)
CAS 490T Topical Senior Seminar in Child and Adolescent
Development (3)

Fieldwork Courses (6 units)

CAS 394/L Practicum Seminar/Practicum in Child and
Adolescent Development (3)
CAS 484/L Practicum Seminar/Practicum in Adolescent and
Youth Services (3)
OR CAS 494/L Practicum Seminar/Practicum in Youth and
Families in Community Settings (3)

Topical Developmental Courses (18 units)

One class from each cluster:

Family and Parenting – CAS 340, CAS 345
Interpersonal Issues – CAS 380, HCOM 220, SOCI 341
Recreation and Health – CAS 327, CAS 360, KNES 387
Diversity and Identity – CAS 375, CHIC 332, EDSC 340,
SOCI 354
Adolescents at Risk – CAS 365, CAS 490T, CRJU 425, CRJU 455,
HESC 321, SOCI 413
Program Planning and Evaluation/Statistics – HUSR 385,
POSC 320, PSYC 201, SOCI 303

OPTION IN FAMILY AND COMMUNITY CONTEXTS (42 UNITS)

The option Family and Community Contexts (FCC) is designed for students planning to work with children, adolescents, and their families in community-based settings and/or preparing for graduate studies in human/child development, counseling, social work or related fields.

Option-Specific Core Courses (18 units)

CAS 300 Elements of Effective Professional Communication (3)
CAS 301 Inquiry and Methodology in Development (3)
CAS 310 Assessing and Observing Development (3)
CAS 325A Conception through Age 8 (3)
CAS 325B Age 9 through Adolescence (3)
CAS 490T Topical Senior Seminar in Child and Adolescent
Development (3)

Fieldwork Courses (6 units)

CAS 394/L Practicum Seminar/Practicum in Child and Adolescent
Development (3)
CAS 494/L Practicum Seminar/Practicum in Youth and Families in
Community Settings (3)

Topical Developmental Courses (18 units)

One class from each cluster:

Abnormal Behavior – PSYC 341, SOCI 466
At-Risk Issues – CAS 365, HESC 321, HUSR 415, HUSR 430,
SOCI 385, SOCI 408
Biology – BIOL/KNES 210, BIOL 305, PSYC 306
Family Systems – CAS 340, CAS 345, SOCI 351
Measurement/Statistics – PSYC 201, SOCI 303
Theoretical Perspectives – HUSR/COUN 380, HCOM 407,
PSYC 431, PSYC 481, SOCI 300

MINOR IN CHILD AND ADOLESCENT DEVELOPMENT (21 UNITS)

A minimum of 12 units of coursework for the minor must be distinct from coursework that is applied to the major. No more than six units of lower-division coursework may be applied to the minor. A grade of “C” (2.0) or better is required in all courses applied to the minor.

Core Courses (9 units)

One developmental survey course (3)

CAS 101 Introduction to Child and Adolescent Studies (3)
CAS 312 Human Growth and Development (3)
CAS 315 Child Development (3)

Developmental context course (3)

CAS 201 Introduction to Child, Family and Community (3)

Developmental depth course (3)

CAS 321 Infant/Toddler Development (3)

CAS 326 Optimizing Development of School Aged Children (3)

CAS 330 Adolescence and Early Adulthood (3)

OR approved alternate

Research Methods (3 units)

CAS 301 Inquiry and Methodology in Development (3)

OR CAS 305 Advanced Assessment in Early Childhood (3)

OR approved alternate

Electives (9 units)

Nine units selected in consultation with department adviser.

May include CAS 394/L

CHILD AND ADOLESCENT STUDIES COURSES

Courses are designated as CAS in the Class Schedule.

101 Introduction to Child and Adolescent Development (3)

Overview of major concepts and related professional opportunities. Practical applications will be considered within different biological, familial, social and cultural contexts to facilitate understanding of influences on developmental outcomes.

120 Youth Development in After-School Programs (3)

For individuals in or who are currently working in after-school programs. Relevant developmental issues and effective strategies for interfacing with youth to support positive outcome in after-school programs. One or more sections offered online.

140 Introduction to Early Childhood (2)

Prerequisite: concurrent enrollment in CAS 140L. Learn about and plan developmentally appropriate activities in early childhood settings for children ages 0-8 and their families.

140L Introduction to Early Childhood Practicum (1)

Prerequisite: concurrent enrollment in CAS 140. First of a year-long practicum sequence for Child and Adolescent Development majors pursuing the Early Childhood Development Option. How to implement developmentally appropriate activities in early childhood settings. Minimum of four hours per week for a total of 60 hours required for the semester. Credit/no credit grade option only.

141 Intermediate Seminar in Early Childhood (2)

Prerequisites: CAS 140, 140L. Corequisite, 141L. Builds on an introductory practicum as students learn about and plan developmentally appropriate activities to early childhood settings for children 0-8 and their families.

141L Intermediate Practicum Early Childhood (1)

Prerequisites: CAS 140, 140L. Corequisite, 141. Supervised field experience in early childhood setting for children 0-8 and their families. Implementation of developmentally appropriate activities. Minimum of four hours per week for a total of 60 hours required for the semester. Credit/no credit grade option only.

201 Child, Family and Community (3)

Overview of interpersonal relationships between child, family and community members; the interaction among systems, influences of age, gender, diverse abilities, culture, race, ethnicity, socio-economic and public policy factors, and community resources available to support family systems.

210 Orientation to the Field of Child Development (3)

Introduction to the field of child development. Survey of programs and services for children, adolescents and young adults, and exploration of professional opportunities, organizations and publications.

215 Observations in Early Childhood Settings (3)

Prerequisite: CAS 101. Introduces the appropriate application and limits of a variety of observation methods for use with young children and in early childhood settings; several assessment tools will be studied. Hands-on observations will focus on children, interactions, and environments.

300 Elements of Effective Professional Communication (3)

Prerequisite: sophomore standing. Styles of written communication common to child development programs and services. Reporting on theories and research to multiple audiences (e.g., other professionals, parents, community groups) in written and oral formats. Meets upper-division baccalaureate writing course requirement for Child and Adolescent Development majors.

301 Inquiry and Methodology in Development (3)

Prerequisite: sophomore standing. Framework and methods necessary for interdisciplinary study of child development. Conducting library research, reading and writing scientific reports, using descriptive and inferential statistics, developing computer literacy, and exploring developmental methodology and theory. (2 hours lecture, 2.5 hours laboratory)

305 Advanced Assessment in Early Childhood (3)

Prerequisite: CAS 101, 215. Relevant literature, observation and assessment strategies, research design and data analysis as relevant to young children. Effective oral and written communication for diverse audiences found in early childhood settings. Meets upper-division baccalaureate writing course requirements for Child and Adolescent Development majors.

310 Assessing and Observing Development (3)

Prerequisites: CAS 101, 201, 300, 301. Purposes and methods associated with assessing and observing child and adolescent development. Topics include selection of appropriate methods, survey of standardized measures, ethics, and interpretation and implications of data.

312 Human Growth and Development (3)

Prerequisite: Psychology 101. Biological/ physical, socio-emotional, cognitive development across the lifespan. One or more sections offered online.

315 Child Development (3)

Prerequisite: completion of the General Education (G.E.) Category D.1. Major concepts, principles, theories and research related to cognitive, linguistic, social, emotional and physical development from birth through adolescence; emphasizes developmentally appropriate practices. One or more sections offered online.

321 Infant and Toddler Development (3)

Prerequisite: CAS 101. Normative and atypical physical, social, emotional and cognitive development for children 0-3 years of age and implications of infant and toddler child care services with an emphasis on developmentally appropriate practices.

322 Preschool-Age Development (3)

Prerequisites: CAS 101, 321. Normative and atypical physical, social, emotional and cognitive development for children 3-6 years of age and implications on child care services provided for preschool-aged children with an emphasis on developmentally appropriate practices.

323 Primary-Age Development (3)

Prerequisite: CAS 322. Normative and atypical physical, social, emotional and cognitive development for primary-aged children and implications of after-school program services with an emphasis on developmentally appropriate practices.

325A Conception through Age 8 (3)

Prerequisites: CAS 101, 201, 300, 301. Research, theories and their application to biological/physical, socio-emotional and cognitive development from conception through age 8. One or more sections offered online.

325B Age 9 through Adolescence (3)

Prerequisites: CAS 101, 201, 300, 301, 325A. Research, theories and their application to biological/physical, socio-emotional, and cognitive development from age 9 through adolescence. One or more sections offered online.

326 Optimizing Development of School Age Children (3)

Prerequisite: CAS 101 or equivalent. Conditions that impact and facilitate development during middle childhood. These include external (e.g., appropriate support and empowerment across various contexts) and internal assets (e.g., social competence and commitment to learning). Highlights strategies that promote development. One or more sections offered online.

327 Optimizing Development During Adolescence (3)

Prerequisite: CAS 101. Conditions that impact and facilitate development during adolescence. External (e.g., appropriate support and empowerment across various contexts) and internal (e.g., self-concept, commitment to learning) assets. Strategies that promote development.

330 Adolescence and Early Adulthood (3)

Prerequisite: Psychology 101. Human development during and following adolescence. Community resources and services for adolescents and their families. Consequences of adolescent experiences for later development.

340 Parenting in the 21st Century (3)

Prerequisite: completion of a G.E. Category D.1 course. Goals and patterns of parenting in context of contemporary, multicultural society; identifies changing demands of parenting infants, children and adolescents; summarizes current scholarly research on relation of parenting practices to child development outcomes. One or more sections offered online.

341 Working with Parents of Young Children (3)

Prerequisites: CAS 305, 321. Responsibilities and influences of diverse family systems, from the transition to parenting through children completing primary grades. Effective collaboration and communication with parents during early childhood years with the goal of optimizing children's development.

345 Child and Adolescent Development in Diverse Family Contexts (3)

Prerequisites: CAS 300, 301. Patterns and processes of child/adolescent development within families of various cultural/ethnic/social contexts. Identifies multiple theoretical and disciplinary perspectives in studying child and family developmental processes, as well as summarizing the current related scholarly literature.

346 Modern Culture and Early Childhood (3)

Prerequisites: CAS 305, 322. Impact of cultural diversity, media, family practices and related education policies on young children's development, including cognitive and social skills, and the application of the information in early childhood settings. One or more sections offered online.

351 Language and Literacy Development in Early Childhood (3)

Prerequisites: CAS 305, 322. Integrates a deep understanding of early language and literacy development with theory, research and practical strategies for facilitating children's mastery of these skills. Developmental norms, individual and cultural variations, and curricular strategies are addressed.

352 Numeracy and Science in Early Childhood (3)

Prerequisites: CAS 305, 323. Theory and research on children's scientific inquiry and numeracy development. Integrates science and mathematics in early childhood settings through interdisciplinary thematic units.

353 Learning and Motivation in Early Childhood (3)

Prerequisites: CAS 305, 321, 322. Building on the foundation developmental classes, this class examines theory and research on children's learning, cognition and motivation with an emphasis on practical applications in early childhood settings. Developmental norms, individual and cultural variations, and curricular strategies.

360 Adolescents and the Media (3)

Prerequisite: completion of G.E. Category D.1. Summarizes current social, cultural and behavioral research on adolescents and mass media. How teens use, learn, are depicted in and shape cultural meaning from exposure to television and other electronic media.

365 Adolescent Pregnancy and Parenting (3)

Prerequisite: completion of course in G.E. Category D.1. Reviews current knowledge base on adolescent pregnancy and the developmental implications for parent and child. Social, educational and health implications of early parenting, and articulates the resources, skills and supports needed to foster success in parenting.

370 Development of African American Children and Youth (3)

Prerequisite: completion of G.E. Category D.1. Understanding cognitive and socio-emotional development of African American children and youth is facilitated through comprehensive examinations of significant African and African American cultural and historical experiences; and social influences including families, schools, socioeconomic status, neighborhoods and American society. (Same as Afro 370)

375 Adolescent Identity (3)

Prerequisites: CAS 300, 301, 325A. Concurrent enrollment in CAS 325B recommended, but not required. Adolescent identity within the context of socio-emotional, physical and cognitive development. Special attention paid to the function of sociocultural factors (e.g., ethnicity, peers, family structure) that help forge individual identity within the larger group context.

380 Adolescent Sexuality and Intimate Relationships (3)

Prerequisite: CAS 301. Current trends, potential risks and opportunities associated with adolescents' involvement in sexual and intimate relationships from a normative developmental perspective. Socio-ecological contexts (e.g., families, peers, culture) of adolescents' sexual and relational attitudes/behaviors.

394 Practicum Seminar in Child and Adolescent Development (2)

Prerequisites: CAS 101, 201. Corequisite: CAS 394L. Classroom analysis of field experience focusing on linkages between theory and practice, and skills and techniques of child development professionals. One or more sections offered online.

394L Practicum in Child and Adolescent Development (1)

Corequisite: CAS 394. Supervised field experience in agencies, institutions and organizations serving children and families. Minimum of four hours per week for a total of 60 hours required for the semester. Credit/No Credit grade option only. May be repeated once for credit.

464 Advanced Practicum Seminar in Early Care and Education (2)

Prerequisites: CAS 101, 140, 140L, 201, 215, 305, 321, 322. Corequisite: CAS 464L. Classroom analysis of field experience focusing on linkages between theory and practice, and skills and techniques of early childhood development professionals, including adult supervision.

464L Practicum in Early Care and Education (1)

Corequisite: CAS 464. Supervised field experience in agencies, institutions, and organizations serving young children and families. Minimum of four hours per week for a total of 60 hours required for the semester. Credit/No Credit grade option only. May be repeated for credit.

474 Practicum Seminar in Development in School Settings (2)

Prerequisites: CAS 101, 201, 300, 301, 310, 325A, 394, 394L. Corequisite: CAS 474L. Positive developmental outcomes associated with programs/materials used in elementary school contexts are examined. Developmental theory and research findings are linked to these practice alternatives.

474L Practicum in Development in School Settings (1)

Corequisite: CAS 474. Supervised field experiences in educational setting serving elementary school-aged children. Minimum of four hours per week for a total of 60 hours for credit. Credit/No Credit grade option only. May be repeated for credit.

484 Practicum Seminar in Adolescent and Youth Services (2)

Prerequisites: CAS 101, 201, 300, 301, 310, 325A, 394, 394L. Corequisite: CAS 484L. Classroom analysis of field experience focusing on linkages between theory and practice, and skills and techniques of adolescent development/youth services professionals.

484L Practicum in Adolescent and Youth Services (1)

Corequisite: CAS 484. Supervised field experience in agencies, institutions and organizations serving adolescents and families. Minimum of four hours per week for a total of 60 hours required for the semester. Credit/No Credit grade option only.

490T Senior Seminar in Child and Adolescent Development (3)

Prerequisites: CAS 101, 201, 300, 301, 310, 325A, 325B. Systematic study of theory, methods and findings concerning a specific developmental topic. Variable topics include Children and Adolescents at Risk, Cognition and Motivation, Controversial Issues in Development, Culture and Ethnicity in Development, Life Span Creativity, Life Span Perspective, Families and Development, Gender and Development, Gifted Intelligence, Working for Change: Legislative Advocacy, Moral Development, Self Concept, and Temperament and Development. May be repeated for credit under different topic. One or more sections offered online.

491 Leadership Seminar in Early Childhood (3)

Prerequisites: CAS 305, 323. Capstone course examining leadership, assessment and funding for early childhood programs. Prepares students to use their knowledge of data, theory and literature to promote the well-being of young children and families through advocacy, fundraising and professional activities.

494 Practicum Seminar in Youth and Families in Community Settings (2)

Prerequisites: CAS 101, 201, 300, 301, 310, 325A, 394, 394L. Corequisite: CAS 494L. Classroom analysis of field experience focusing on linkages between theory and practice, and skills and techniques of professionals working with parents and families in school and community settings.

494L Practicum in Youth and Families in Community Settings (1)

Corequisite: CAS 494. Supervised field experience in agencies, institutions and organizations serving parents and families. Minimum of four hours per week for a total of 60 hours required for the semester. Credit/No Credit grade option only. May be repeated for credit.

496 Student-to-Student Tutorial (1-3)

Prerequisites: a 3.0 or higher grade-point average and simultaneous enrollment in the course being tutored or previous enrollment in a similar course or its equivalent. Consult "University Curricula" section of this catalog for more complete course description. May be repeated for a maximum of three total units of credit. Only three units may be taken in a single semester.

499 Independent Study (1-6)

Individual research project, either library or field, under the direction of a Child and Adolescent Studies faculty member. May be repeated for a maximum of nine units of credit. Only six units may be taken in a single semester.



Civil and Environmental Engineering

College of Engineering and Computer Science

INTRODUCTION

The primary goal of the Civil and Environmental Engineering department's degree program is to provide students with the educational background and tools required for them to excel in their intended profession in Civil Engineering. The areas of focus in the civil engineering program are structural, geotechnical, hydraulic, environmental, construction, transportation and architectural engineering. Most course topics are well integrated with computer-aided analysis and design tools.

The undergraduate engineering program is designed to impart knowledge of mathematics and natural sciences to students so that they learn to use the forces of nature and materials economically, while maintaining engineering ethics and high professional standards.

One of the major objectives of this program is to provide design experience to the students gradually from the very beginning years until they graduate, through a variety of courses. During this time, they also learn about safety, reliability, ethics, and socially and globally sensitive problems.

The graduate engineering program is designed for specialization in the areas (also called tracks) of structures, geotechnical, construction management and environmental engineering.

LEARNING GOALS AND STUDENT LEARNING OUTCOMES

The following learning goals and learning outcomes have been established for students pursuing a degree in Civil and Environmental Engineering:

Program Educational Objectives

- A. Technical Growth – Graduates will be successful in modern engineering practice, integrate into the local and global workforce, and contribute to the economy of California and the nation
- B. Professional Skills – Graduates will continue to demonstrate the professional skills necessary to be competent employees, assume leadership roles, and have career success and satisfaction
- C. Professional Attitude and Citizenship – Graduates will become productive citizens with high ethical and professional standards, who make sound engineering or managerial decisions, and have enthusiasm for the profession and professional growth

Program Outcomes

- (a) The ability to apply knowledge of mathematics, science and engineering
- (b) The ability to design and conduct experiments, as well as to analyze and interpret data
- (c) The ability to design a system, component, or process to meet desired needs
- (d) The ability to function on multi-disciplinary teams
- (e) The ability to identify, formulate and solve engineering problems

DEPARTMENT CHAIR

M. Prasada Rao

DEPARTMENT OFFICE/WEBSITE

Engineering 100

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<http://cee.fullerton.edu>

PROGRAMS OFFERED

Bachelor of Science in Civil Engineering
Emphasis in Architectural Engineering
Master of Science in Civil Engineering
Concentration in Environmental Engineering

FACULTY

Pinaki Chakrabarti, Harmonie Hawley,
Hyunjoo Kim, Uksun Kim, Jeff Kuo,
Anne Lemnitzer, David Navish, Mallela
Prasada Rao, Chandrasekhar Putcha,
Binod Tiwari

- (f) An understanding of professional and ethical responsibility
- (g) The ability to communicate effectively
- (h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context
- (i) Recognize the need for and an ability to engage in life-long learning
- (j) A knowledge of contemporary issues
- (k) The ability to use the techniques, skills and modern engineering tools necessary for engineering practice
- (l) The ability to apply knowledge in at least four technical areas appropriate to civil engineering
- (m) An understanding of professional practice, e.g., management, business, public policy, leadership and professional licensing

High School Preparation

The entering freshman's preparation should include two years of algebra, geometry, trigonometry, and one year of physics or chemistry. Students deficient in mathematics or chemistry must take special preparatory courses, which will not carry credit for the major. (See Mathematics Section for Entry Level Mathematics test and Math-Science Qualifying Examination requirements)

Transfer Students

A transfer student shall complete a minimum of 30 units in residence, 15 of which shall be taken in upper-division engineering courses. Work taken at another college or university on which a grade of "D" (1.0) was earned may not be substituted for upper-division courses.

BACHELOR OF SCIENCE IN CIVIL ENGINEERING (129 UNITS)

The Bachelor of Science in Civil Engineering is accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone 410-347-7700. The degree includes 85 units in the major, 30 General Education units, 14 units of electives and all university requirements. When selecting courses, students need to consult a faculty adviser. Course prerequisites are strictly enforced.

All required courses toward the degree must be taken for a letter grade. All required mathematics and science courses must be passed with a "C-" (1.7) or better; the exception is MATH 150A, which must be passed with a "C" (2.0) or better. Graduate courses are not open to undergraduate students without approval of the program coordinator. A GPA of 2.0 or better is required for the major.

Mathematics and Science Courses (34)

- BIOL 101 Elements of Biology (3)
- CHEM 115 Introductory General Chemistry (4)
- MATH 150A Calculus (4)
- MATH 150B Calculus (4)

- MATH 250A Multivariate Calculus (4)
- MATH 250B Introduction to Linear Algebra and Differential Equations (4)
- PHYS 225, 225L Fundamental Physics: Mechanics and Lab (4)
- PHYS 226, 226L Fundamental Physics: Electricity and Magnetism and Lab (4)
- EGCE 308 Engineering Analysis (3)

Introductory Engineering Courses (9)

- EGCE 201 Statics (3)
- EGCE 302 Dynamics (3)
- EGEE 401 Engineering Economics and Professionalism (3)

General Education Courses

Area A: Core Competencies (9 Units)

1. Oral Communication (3)
HONR 101B, HCOM 100, 102
2. Written Communication (3)
ENGL 101
3. Critical Thinking (3)
HONR 101A, HCOM 235, PHIL 105, 106, PSYC 110, READ 290

Area B: Scientific Inquiry and Quantitative Reasoning (11 Units)

1. Physical Science (3)
PHYS 225
2. Life Science (3)
BIOL 101
3. Laboratory Experience (1)
PHYS 225L
4. Mathematics/Quantitative Reasoning (4)
MATH 150A
5. Implications and Explorations in Mathematics and Natural Sciences
Not applicable for engineering majors

Area C: Arts and Humanities (12 Units)

1. Introduction to Arts (3)
ART 101, 201A, 201B, 311, 312, DANC 101, MUS 100, 101
2. Introduction to the Humanities (3)
Any lower-division course in this category listed in the current class schedule
3. Explorations in the Arts and Humanities (3)
Any upper-division course in this category listed in the current class schedule
4. Origins of the World Civilizations (3)
HIST 110A or 110B, 210A, 210B

Area D: Social Sciences (12 Units)

1. Introduction to the Social Sciences (3)
EGCP/EGCE/EGEE 401
2. World Civilizations and Cultures
Not applicable for engineering majors
3. American History, Institutions and Values (3)
AFRO 190, AMST 201, CHIC 190, HIST 180, 190, HONR 201A
4. American Government (3)
HONR 201B, POSC 100
5. Explorations in Social Sciences (3)
Any upper-division course in this category listed in the current class schedule

Area E: Lifelong Learning and Self Development (3 Units)

Not applicable for engineering majors

Area Z: Cultural (3 Units)

Take at least one star (*) course in Sections C.3 and D.5

Upper-Division Writing Requirement

In addition to the Examination in Writing Proficiency, which is to be taken as soon as 60 units are completed, six units from the following courses are required and must be passed with a "C" (2.0) or better. Laboratory reports are graded on English composition, as well as content.

EGCE 324L, 325L, 377, 428L, 431L, 463L, 465, 468

CIVIL ENGINEERING

Mathematics and Science Courses (34 units)

Introductory Engineering Courses (9 units)

Civil Engineering Core Courses (42 units)

- EGCE 206 Computer-Aided Architectural and Civil Engineering Drafting (1)
- EGCE 214 Engineering Surveying (2)**
- EGCE 214L Engineering Surveying Laboratory (1)**
- EGCE 301 Mechanics of Materials (3)
- EGCE 324 Soil Mechanics (3)
- EGCE 324L Soil Mechanics Laboratory (1)
- EGCE 325 Structural Analysis (3)
- EGCE 325L Structural Analysis Laboratory (1)
- EGCE 377 Civil Engineering Materials Lab (1)
- EGCE 408 Reinforced Concrete Design (3)
- EGCE 418 Foundation Design (3)
- EGCE 428 Engineering Hydraulics (3)
- EGCE 428L Engineering Hydraulics Lab (1)

EGCE 430 Structural Steel Design (3)

EGCE 432 Computer-Aided Analysis and Design in Civil Engineering (3)

EGCE 441 Environmental Engineering (3)

EGCE 468 Engineering Construction (3)

EGCE 494 Design of Civil Engineering Structures (3)**

EGCE 494L Civil Engineering Structural Laboratory (1)**

**Corequisites.

Technical Electives in Civil Engineering (14 units minimum)

Before enrolling in any elective course, approval of the adviser must be obtained.

EGCE 411, 431L, 435, 436, 463, 463L, 465, 466, 481, 482, 493, 497, 499

CHEM 125*

EGEE 203*

EGME 304*

GEOL 376*

* Need chair approval.

CIVIL ENGINEERING WITH ARCHITECTURAL ENGINEERING EMPHASIS

Students wishing to earn an Architectural Engineering Emphasis must fulfill the requirements for the Bachelor of Science in Civil Engineering. When choosing their electives, they must consult with an adviser.

MASTER OF SCIENCE IN CIVIL ENGINEERING (30 UNITS)

The Master of Science degree in Civil Engineering is intended to meet the needs of students who wish to prepare for careers in areas such as construction and project management, design and analysis of complex systems (including structures such as tall buildings and bridges), environmental engineering, consulting and research; as well as doctoral studies.

The program provides advanced study within the area of civil engineering and allows students to select coursework, with adviser approval, in the areas of structural engineering, geotechnical engineering, construction engineering, and management and environmental engineering.

Admission Requirements

To be considered for admission, applicants must meet the following university and departmental requirements:

- Bachelor's degree from a regionally accredited institution
- Minimum grade-point-average of 2.5 in the last 60 semester units
- Good standing at the last institution attended

Students meeting the above requirements will be admitted to the graduate program in Civil Engineering and will be advanced to classified standing immediately after filing an adviser-approved study plan in the Civil and Environmental Engineering Department office. Students not meeting the above requirements may be admitted and will be required to take additional prerequisite coursework.

Any student entering the M.S. degree program without a B.S. in Civil Engineering will be required to complete deficiency courses prior to beginning coursework for the master's degree. All deficiency courses must be completed before the final semester of coursework.

Students who possess a bachelor's degree from a postsecondary institution where English is not the principal language should submit a TOEFL score of 80 or better. The Civil and Environmental Engineering Department does not require the Graduate Record Exam (GRE).

Application Deadlines

Refer to: www.fullerton.edu/ecs for application information.

Classified Standing

Students will be advanced to classified standing and are eligible to take graduate courses for which they are qualified by meeting the following requirements.

1. Complete all deficiency work specified by the graduate adviser with a "B-" (2.7) or better before starting graduate courses (unless approved by the chair);
2. meet with an adviser prior to completing nine units toward the M.S. degree at CSUF to develop a study plan, which must be approved by the department chair and Office of Graduate Studies; and
3. fulfill the university writing requirement prior to completing nine units at CSUF toward the M.S. Degree by successfully completing one of the following:
 - An upper-division writing requirement at any CSU campus
 - An upper-division writing course from another university that is equivalent to a course satisfying the CSUF Upper-Division Writing Requirement. Equivalency must be certified by the department chair
 - Cal State Fullerton Examination in Writing Proficiency (EWP)
 - A CSUF upper-division or graduate-level course that is certified as meeting the writing requirement and is approved by the department chair. A grade of "C" (2.0) or better is required

Study Plan

The study plan consists of adviser-approved upper-division or graduate-level coursework, which must be completed with an overall grade-point average of at least 3.0. At least half the units required for the degree must be in approved graduate (500-level) courses.

Required Courses (6 units)

EGGN 403 and an additional three-unit, adviser-approved math-oriented course, or six units adviser-approved electives (for those focusing on environmental and construction areas).

Course Tracks (15 units)

Students are required to select a minimum of 15 units in Civil Engineering. These units may be 400- (subject to approval by the department chair) and 500-level courses and are selected according to each student's area of interest. Coursework may focus on the following areas: Geotechnical Engineering; Structural Engineering; and Construction Engineering and Management. Upon graduation, students will receive a Master's degree in Civil Engineering. Environmental Engineering track students will receive a Master's degree in Civil Engineering with a concentration in Environmental Engineering.

Other Courses (9 units)

Elective units should be taken in Civil Engineering or a related engineering field and are subject to adviser approval.

CONCENTRATION IN ENVIRONMENTAL ENGINEERING

Required Concentration Courses (15 units):

EGCE 481 Solid Waste Technology and Management (3)

EGCE 482 Liquid Waste Technology and Management (3)

Adviser-approved Environmental Engineering courses, which may include Thesis, Project or Independent Study (9)

Electives (15 units)

Adviser-approved electives must include a minimum of six units in non-Environmental Engineering courses.

Students enrolling in less than six units of Independent Study/Thesis/Project will be required to take an oral comprehensive exam. Students enrolling in six units of thesis or project may defend their thesis or project instead of taking an oral comprehensive exam.

CIVIL AND ENVIRONMENTAL ENGINEERING COURSES

Courses are designated as EGCE in the class schedule

201 Statics (3)

Prerequisites: MATH 150B, PHYS 225. Vectorial treatment of statics of particles and rigid bodies. Free body diagrams. Applications to problems of equilibrium (two and three dimensions) of structural and mechanical force systems. Trusses, frames and machines. Friction problems. Centroids and moments of inertia.

206 Computer-Aided Architectural and Civil Engineering Drafting (1)

Architectural and civil engineering drawing with the aid of computer-aided drafting techniques; grading plans, engineering drawings (including standard structural, electrical and hydraulic details) of buildings, bridges, dams and civil engineering structures. Bill of Materials. (3 hours laboratory)

214 Engineering Surveying (2)

Corequisite: EGCE 214L. Basis of plane surveying. Distance measurement using tapes and EDM. Leveling. Measurement of angles and directions. Traverse and topographic survey and computations. Applications in highway curves, construction surveys and land surveys. Principles of stadia.

214L Engineering Surveying Laboratory (1)

Corequisite: EGCE 214. Field practice of measuring distance, difference of elevation, and horizontal and vertical angles using tapes, EDM, automatic levels, theodolites and total stations. (3 hours laboratory)

301 Mechanics of Materials (3)

Prerequisites: MATH 250A, EGCE 201. Stress and deformation analysis for axial load, torsion, flexure and combined forces. Analysis of simple statically indeterminate structures. Deflection and stress analysis of beams. Stability of columns. Strain energy and ultimate resistance. Interactive relationships between analysis and design.

302 Dynamics (3)

Prerequisites: MATH 250A, EGCE 201. Kinematics and kinetics of particles and rigid bodies, kinetics of rigid bodies in three dimension, Newton's laws, work and energy, impulse and momentum. Solution of problems using vector approach.

305 Failure of Building and Structure Due to Earthquakes and After Effects (3)

Prerequisites: one course from General Education Category B.4 or B.1. Geological aspects of earthquakes as they apply to building safety; introduction to earthquake-related problems and building damages cause by historic earthquakes. Destruction aspects of earthquakes, preparedness for large earthquakes and how to protect structural and non-structural parts of buildings. (Same as Geology 305)

308 Engineering Analysis (3)

Prerequisites: PHYS 226 and MATH 250B or equivalent. Fundamentals and engineering applications of Fourier transforms, Laplace transforms, complex analysis, vector analysis; engineering applications. (Same as EGEE/EGGN/EGME 308)

324 Soil Mechanics (3)

Prerequisite: EGCE 301. Soil properties and soil action as related to problems encountered in engineering structures; consolidation, shear strength, stability and lateral earth pressures.

324L Soil Mechanics Laboratory (1)

Prerequisites: ENGL 101, EGCE 324. Behavior and properties of soils. Application to foundation design, liquefaction and seepage.

325 Structural Analysis (3)

Prerequisite: EGCE 301. Forces and displacements in statically determinate and indeterminate elastic structures by force and displacement methods. Approximate methods of analysis. Matrix formulation of structural analysis and computer applications. Introduction to structural design.

325L Structural Analysis Laboratory (1)

Prerequisites: ENGL 101, EGCE 325. Principles of model analysis and similitude. Influence lines for reactive and internal forces; generalized displacements of statically indeterminate structures. Nonprismatic members. (3 hours laboratory)

377 Civil Engineering Materials Laboratory (1)

Prerequisites: EGCE 324, 325. Behavior and properties of most common materials, e.g., steel, concrete, wood, masonry and asphalt. Mix design of asphalt and concrete. Determination of strain and stress using strain gages. Specimen testing according to ASTM. Material properties determination. Safety, reliability, and design considerations. (3 hours laboratory)

401 Engineering Economics and Professionalism (3)

(Same as EGCP/EGEE 401)

408 Reinforced Concrete Design (3)

Prerequisite: EGCE 325. Design for bending, shear, axial force, torsion and combined loading. Beam, columns, slab and foundation design for ultimate strength and serviceability requirements. Prestressed concrete design. Safety, reliability and cost considerations. Design project conforming to latest ACI code. Professional computer program. Not available for graduate degree credit. (2 hours lecture, 3 hours lab)

411 Structural Dynamics (3)

Prerequisites: EGCE 308, 325. Free and forced vibrations of discrete and continuous systems. Matrix formulation and normal coordinates analysis. Response of structures to impulse and earthquake loads. Application to structural design problems and comparison with code prescribed forces.

418 Foundation Design (3)

Prerequisites: EGCE 324, 408. Footings and retaining walls design. Mat and piled foundations for structures. Design project to standards of professional practice using latest codes and standards. Consideration for safety, reliability and cost.

428 Engineering Hydraulics (3)

Prerequisite: EGCE 302. Incompressible fluid flow in closed conduits and open channels. Hydrostatics, energy and hydraulic grade lines. Momentum, friction formulas, pipelines, uniform flow and water surface profiles. Design of pipes and open channels. Computer solutions. Not available for graduate degree credit.

428L Engineering Hydraulics Laboratory (1)

Prerequisites: ENGL 101, EGCE 428. Introduction to experimental hydraulics in open channel and pipe flows, including measuring discharge, depth, velocity, force and friction coefficients. Hydraulic model laws and report writing. (3 hours laboratory)

430 Structural Steel Design (3)

Prerequisite: EGCE 325. Design for bending, torsion, shear, axial forces, combined loadings. Design of built-up girders, composite construction. Design of shear and moment connections. Design project using professional practice standards. LRFD method. Safety, reliability and cost considerations. Professional computer program. Not available for graduate degree credit. (2 hours lecture and 3 hours lab)

431L Advanced Structural Laboratory (1)

Prerequisites: EGCE 325L and either EGCE 408 or EGCE 430. Fundamentals of earthquake engineering and soil structure interaction; design of lateral bracing for model buildings. (3 hours laboratory)

432 Computer-Aided Analysis and Design in Civil

Engineering (3)

Prerequisites: EGCE 206, 324, 325. Computer-aided analysis and design in various branches of civil engineering. Introduction of finite element methods with computer techniques. Application of professional computer programs. (2 hours lecture, 3 hours laboratory)

435 Design of Hydraulic Structures (3)

Prerequisite: EGCE 428. Applications of hydraulic principles to design of various structures, including spillways, energy dissipaters, outlet works, storm drains, culverts and water distribution systems. Use of computers in design process.

436 Engineering Hydrology (3)

Corequisite: EGCE 428. Hydrologic cycle with applications to hydrologic design of engineering structures. Rainfall, stream flow, ground water, surface runoff, hydrographs, flood routing, frequency distributions and design hydrographs.

441 Environmental Engineering (3)

Prerequisites: BIOL 101 or CHEM 115. Planning and controlling the environment; wastewater treatment and disposal; solid waste management; air pollution; radiation protection; housing and residential environment.

463 Precast and Prestressed Concrete Design (3)

Prerequisite: ECCE 408. Prestressed concrete design and analysis for conventional and lateral loading. Designing reinforced and prestressed structural and architectural elements. Safety and economy. Connection design for earthquake and wind loadings. Design projects using professional practice standards including latest codes. (2 hours lecture and 3 hours laboratory)

463L Precast and Prestressed Concrete Design Lab (1)

Prerequisites: EGCE 408 and EGCE 463 or equivalent. Behavior of prestressed and reinforced concrete members subjected to the different types of loadings. Observing elastic and ultimate strength behavior, deflection crack propagation and collapse. Observing prestressing operation and camber. (3 hours laboratory)

465 Planning and Control of Engineering Construction Projects (3)

Prerequisite: senior standing. Overview of construction project management; construction scheduling fundamentals: bar charts, CPM, PERT; schedule control: manual vs. computer systems, reports, schedule maintenance; cost control: code of accounts, control base, budgets, forecasting, reports, computer systems; applications in construction projects.

466 Public Transit Systems Planning and Operations (3)

Prerequisite: senior standing in Civil Engineering. Urban passenger transportation modes, paratransit, special modes, vehicles characteristics and motion, highway transit mode, rail transit mode, new concepts, transit system performance (capacity, productivity, efficiency and utilization, organization and financing).

468 Engineering Construction (3)

Prerequisite: EGCE 325. Engineering construction planning equipment and methods. Construction management. Critical path method. Construction of buildings, bridges, highways, foundations and dams. Consideration for safety and reliability.

481 Solid Waste Technology and Management (3)

Prerequisite: EGCE 441 or equivalent. Process dynamics and kinetics; thermal, physical, chemical and biological treatment operations; immobilization process; residual management and treatment process train selection.

482 Liquid Waste Technology and Management (3)

Prerequisite: EGCE 441 or equivalent. Process dynamics; reactions and kinetics; reactor engineering and process design; pretreatment operations and physical, chemical and biological treatment operations; residual management and treatment process train selection.

493 Structural Systems Emphasis on Highrise Structures (3)

Prerequisite: EGCE 408 or 430. Corequisite: EGCE 418. Structural concepts and systems for buildings and complex structures and their behavior under loads. Roof, floor, wall systems. Characteristics and design concepts of complex structures and high-rise buildings. Design project. Latest building codes and computer application. Sustainability and green building. (2 hours lecture and 3 hours laboratory)

494 Design of Civil Engineering Structures (3)

Prerequisites: EGCE 408, 430. Corequisites: EGCE 418 and 494L. Timber, reinforced masonry, reinforced concrete and steel design. Use of Uniform Building Code and standards. Design of buildings and bridges. Design projects to standards of professional practice. Reliability, safety and cost consideration. Computer application. (2 hours lecture; 3 hours laboratory)

494L Civil Engineering Structural Laboratory (1)

Corequisite: EGCE 494. Design of bridges according to AAS-HTO code. Design project to the standards of professional practice. (3 hours laboratory)

496 Architectural Design (3)

Prerequisite: EGCE 408 or 430 or senior standing or consent of instructor and department head. History of architectural design. Systems-based design process: aesthetic, functional, environmental and behavioral aspects. Urban planning and design. Case studies. Architectural design project to the standards of professional practice.

497 Senior Projects (1-3)

Prerequisites: senior standing in engineering and formal approval by adviser and department head. Independent design projects. Formal report to be submitted after completion of project work.

499 Independent Study (1-3)

Prerequisites: senior standing in engineering and formal approval by adviser and department head. Special topics in civil engineering. Formal report to be submitted after completion of independent study.

501 Analytical Methods for the Design of Civil Engineering Systems (3)

Prerequisite: graduate standing or equivalent. Applying linear and dynamic programming principles to the design of pipelines, irrigation systems, water-resources and traffic-flow control problems. Probabilistic network analysis. First order and advanced first order second moment reliability methods. Probabilistic design.

509 Theory of Plates and Shells (3)

Prerequisite: EGME 438 or equivalent. Theory of thin plates subjected to transverse loads. Analysis of plates of circular, rectangular and other shapes. Theory of thin shells. Shells of revolution. Shells of translation.

510 The Finite Element Method (3)

Prerequisites: EGCE 517 and 533 or equivalent. Formulating finite elements for analyzing plane stress and strain problems, axisymmetric bodies, plates and shells. Conforming and non-conforming shape functions. Computer applications to complex structural systems under static and dynamic loads.

515 Geo-Environmental Engineering (3)

Prerequisite: EGCE 436 or equivalent. Geo-environmental properties and soil action related to problems encountered in waste management engineering; physico-chemical soil properties, shear strength as applied to landfill design and lateral earth pressures on braced excavation; contaminant migration and partitioning in unsaturated soils.

517 Theory of Elasticity (3)

Prerequisite: EGME 438 or equivalent. Stress and strain. Equations of elasticity. Extension, torsion and flexure of beams. Two-dimensional elastostatic problems. Variational methods and energy theorems. Elementary three-dimensional elastostatic problems. Introduction to thermoelasticity and wave propagation.

532 Earthquake Engineering (3)

Prerequisites: EGCE 411 and, 533 or equivalent. Earthquake motions; response spectra; computational methods and computer applications for response of structural systems. Energy absorption capacity of materials and structural components. Soil structure interaction. Seismic design and evaluation of current building codes.

533 Matrix Methods of Structural Analysis (3)

Prerequisites: EGCE 325, EGGN 403. Matrix formulation of structural analysis using the direct stiffness approach. Comparing flexibility and stiffness approaches. Computer-aided analysis of complex structural systems under static and dynamic loads. Stability analysis. Introduction to the finite element method.

534 Construction Methods and Equipment for Buildings (3)

Prerequisites: EGCE 408, 430. Methods and equipment for constructing high-rise buildings, space structures, folded plates, shells and suspension systems. Modularization. Quality control and construction failures.

537 Groundwater and Seepage (3)

Prerequisite: EGCE 436 or equivalent. Equations governing flow of liquid in porous media. Seepage through dams and under structures, flow in confined and unconfined aquifers, steady and unsteady flow, well fields, flow nets, computer solutions, sea water intrusion, recharge, groundwater pollution.

538 Construction Methods and Equipment for Heavy Construction Engineering (3)

Prerequisites: EGCE 408, 418. Methods and equipment for constructing foundations, highways, airfields, bridges, ports, harbors, dams, nuclear power plants and industrial facilities. Quality control and construction failures.

539 Preconstruction Design Evaluation (3)

Prerequisite: EGCE 534 or equivalent. Cost benefit, preconstruction scheduling and constructability modifications in design, specifications and construction methods. Value Engineering.

544 Advanced foundation engineering (3)

Prerequisite: EGCE 418. Design foundations for earthquake loading and problematic soils; design piles and caissons, ground surface subsidence, slope stability and stabilization, anchored bulkheads and dam sections.

546 Coastal Pollution Engineering (3)

Prerequisite: EGCE 436 or equivalent. Storm water runoff, best management practices for storm water runoff, waste water discharge to lakes, rivers and oceans, wetland construction and management, remediation of contaminated sediments.

549 Theory of Elastic Stability (3)

Prerequisites: EGCE 509 and 517 or equivalent. Critical buckling loads of columns, beam-columns, frames, plates and shells. Lateral stability of beams. Torsional buckling of open wall sections.

550 Major Commercial Project Development and Management (3)

Prerequisite: any 400-level management course approved by the department head. Process of major commercial project development; macroeconomics aspects; project initiation and implementation, construction management systems, schedule, cost and quality control, control of long-lead equipment and materials, construction disputes and claims, case studies.

556 Construction Cost Control, Scheduling and Planning (3)

Prerequisite: EGCE 465 or 468 or equivalent. Systems approach for estimating, scheduling, cost comparison, risk analysis and cost control. Project feasibility studies and alternative approaches. Project control, baseline establishment, cost and claim management.

557 Cost Estimating and Bidding Strategy (3)

Management and cost control of large capital projects. Capital cost estimation, value prediction and control, cost and schedule control and management of mega projects.

559 Environmental and Public Transportation Regulations (3)

Prerequisite: EGCE 441 or equivalent. Environmental regulations, clean air act, intermodal surface transportation efficiency act of 1991, Federal Transit Administration project planning guidelines, planning for public transit and environmental requirement, developing required environmental documents; procedure for major investment studies; future of public transportation. Project.

563 Advanced Prestressed and Reinforced Concrete Design (3)

Prerequisite: EGCE 408 or 463. Prestressed concrete theory. Continuous prestressed concrete members, flat plate systems, virend-eel systems, application of unbounded posttensioning – theory and design. Yield line theory, limit analysis and cracking of concrete. Designing prestressed dome roof, barrel shell and hyperbolic paraboloid shell. Design project to standards of professional practice. Computer application. (2 hours lecture and 3 hours lab).

566 Design of Tall Buildings (4)

Prerequisite: EGCE 408 or 430; EGCE 533 or equivalent. Characteristics, design criteria and safety provisions of tall buildings. Selecting, optimizing and analyzing framing systems. Design standards, constructability, wind and seismic considerations. Design project to the standards of professional practice. Computer application.

575 Data Mining in Sustainability (3)

Expert systems and artificial intelligence techniques in construction engineering; expert systems for: safety evaluation of structures during construction, site selection, construction decision making, and construction schedule analysis; project monitoring; claims and disputes.

583 Air Pollution Control Engineering (3)

Prerequisite: EGCE 441. Formation and control of air pollutants. Provides a strong foundation for designing and developing engineering solutions, devices and systems for industrial air pollution prevention and control.

597 Project (1-6)

Prerequisites: Classified graduate status and formal approval of Civil Engineering Graduate Committee, graduate adviser and department head.

598 Thesis (1-6)

Prerequisites: classified graduate status and formal approval of Civil Engineering Graduate Committee, graduate adviser and department head. (Maximum of 3 units per semester)

599 Independent Graduate Research (1-3)

Prerequisites: classified graduate status and formal approval of Civil Engineering Graduate Committee, graduate adviser and department head.



Communications

College of Communications

INTRODUCTION

Effective ethical communications are essential for the well being of a democratic society. Thus, there is a need for persons trained in the theory and practice of informing, instructing and persuading through communications media.

LEARNING GOALS AND STUDENT LEARNING OUTCOMES

The following goals and learning outcomes have been established for students pursuing a degree in communications:

Functional knowledge

- Demonstrate skills and knowledge for entry into professional practice and/or advanced academic programs

Critical thinking and research skills

- Apply critical thinking, research, and analysis to meet personal, scholarly, and professional goals

Written and oral proficiencies

- Demonstrate written and oral proficiency appropriate to the entry level of professional practice

Information technology skills

- Demonstrate effective use of communications tools and technologies appropriate to the entry level of professional practice

Theoretical foundations of communications

- Apply appropriate concepts, models, and theories of communications to personal and professional situations

Diversity awareness

- Exhibit sensitivity to diversity through communications practices

Historical, legal and ethical foundations of communications

- Demonstrate a basic knowledge of historical, legal, and ethical issues that affect professional practices

BACHELOR OF ARTS IN COMMUNICATIONS (120 UNITS)

The Communications major totals 48 units: 12 units of core requirements; 24 units in a chosen concentration; and 12 units of collateral upper-division coursework in other departments. All prerequisite courses must be completed with a grade of "C" (2.0) or better. Of the 80 units taken outside Communications, 65 must be in the traditional liberal arts, humanities and sciences.

DEPARTMENT CHAIR

Anthony R. Fellow

DEPARTMENT OFFICE/WEBSITE

College Park 400

657-278-3517

<http://communications.fullerton.edu>

PROGRAMS OFFERED

Bachelor of Arts in Communications

Concentrations:

Advertising

Entertainment Studies

Journalism

Photocommunications

Public Relations

Minors

Advertising

Journalism

Public Relations

Master of Arts in Communications

Concentrations:

Professional Communications

Mass Communications Research
and Theory

FACULTY

Carol Ames, Genelle Belmas, Jeff Brody,

Pamela Caldwell, Thomas Clanin,

Carolyn Coal, David DeVries, Emily

Erickson, Beth Georges, Tony Fellow,

Brent Foster, Dennis Gaschen, xtine

Burrough, Dean Kazoleas, Kuen-Hee

Ju-Pak, Cynthia King, Mark Latonero,

Paul Lester, Gail Love, Jay Moon, Coral

Ohl, Henry Puente, Jason Shepard, Nan-

cycy Snow, Andi Stein, Doug Swanson,

Laura Triplett, Edgar Trotter, Robert

Wheeler, Diane Witmer, Gerald Wright,

Mark Wu, Fred Zandpour

Communications Core

All students pursuing a Bachelor of Arts in Communications, regardless of concentration or emphasis, must fulfill these required courses.

Required coursework (9 units)

COMM 233 Mass Communications in Modern Society (3)

COMM 407 Communications Law (3)

COMM 425 History and Philosophy of American Mass Communication (3)

Plus three units from:

COMM 300 Visual Communication (3)

COMM 310 Mass Media Ethics (3)

COMM 333 Mass Media Effects (3)

COMM 410 Principles of Communication Research (3)

COMM 422 Communications Technologies (3)

COMM 426 Global Media Systems (3)

COMM 480 Persuasive Communications (3)

CONCENTRATION COURSES

Advertising

COMM 350 Principles of Advertising (3)

COMM 351 Writing for the Advertising Industry (3)

COMM 352 Advertising Media (3)

COMM 353 Advertising Creative Strategy and Execution I (3)

COMM 451A, B or C Advertising Campaigns (3)

COMM 495 Mass Media Internship (3)

Plus six units from – COMM 317, 358, 361, 380, 410, 415T, 446, 450, 452, 453, 454, 455 456. At least three of the six units must be 450 or higher.

Entertainment Studies

COMM 101 Writing for Mass Media (3)

COMM 346 Introduction to Entertainment and Tourism Studies (3)

COMM 446 Entertainment and Society (3)

COMM 449 Capstone in Entertainment and Tourism Studies (3)

COMM 495 Mass Media Internship (3)

Plus three units from – COMM 301, 334, 351, 362, 471

Plus six units from – COMM 317, 333, 350, 361, 380, 410*, 422*, 426*, 436, 447, 448T, 465, 497T

*Course may count either as a core elective or as a concentration elective, but not as both.

Journalism

COMM 101 Writing for the Mass Media (3)

COMM 495 Mass Media Internship (3)

Print Journalism Emphasis

COMM 201 Reporting for the Mass Media I (3)

COMM 202 Reporting for the Mass media II (3)

COMM 332 Editing and Design (3)

COMM 471 News Media Production (3)

Plus six units from – COMM 331, 334, 335, 380, 433, 434, 435, 436, 437, 438T

Broadcast Journalism Emphasis

COMM 201 Reporting for the Mass Media I (3)

COMM 202 Reporting for the Mass media II (3)

COMM 372 TV News Production (3)

COMM 472 Advance Electronic News Production (3)

Plus six units from – COMM 331, 334, 335, 371, 380, 435, 436, 438T

Visual Journalism Emphasis

COMM 319 Visual Reporting

COMM 380 Interactive Media Design (3)

COMM 409, Advanced Visual Reporting (3)

COMM 471 News Media Production (3)

Plus six units from – COMM 332, 380, 436, 438T

Photocommunications

COMM 101 Writing for the Mass Media (3)

COMM 317 Digital Foundations (3)

COMM 444 Capstone for Visual Communications (3)

COMM 495 Mass Media Internship (3)

Plus three units from – COMM 301, 334, 362

Plus nine units from – COMM 319, 321, 380, 409, 421, 434, 471, 481

Public Relations

COMM 101 Writing for Mass Media (3)

COMM 361 Principles of Public Relations (3)

COMM 362 Public Relations Writing (3)

COMM 464 Public Relations Management (3)

COMM 495 Mass Media Internship (3)

Plus three units from – COMM 301, 334, 462, 471

Plus three units from – COMM 410*, 465, 467, 468, 469, 470, 497T

Plus three units from – COMM 317, 346, 350, 363, 380, 434, 437, 446

*Course may count either as a core elective or as a concentration elective, but not as both.

WRITING REQUIREMENTS

All communications majors must satisfy both departmental and university writing requirements. For the department Writing Requirement, each concentration requires one or more writing courses. Consult an adviser or concentration checklist.

University Writing Requirement: The coursework portion of the university's upper-division baccalaureate writing requirement for communications majors may be met by satisfactory completion of any one of COMM 301, 334, 335, 351, 362, 371, 435, 436, 438T or 471. Students must earn a "C" (2.0) or better in the course that is used to fulfill the university's upper-division writing requirement.

INTERNSHIP REQUIREMENTS

The Department of Communications has always recognized the beneficial attributes of an internship. Students intern at sites in Orange and Los Angeles counties, as well as at national and international sites. Students must meet the following prerequisites to meet the internship requirement:

- Communications major
- Senior standing 2.25 GPA cumulative and CSUF
- Specific prerequisites for each area of concentration – which are **not to be taken concurrently with the internship**. They include:

Advertising

Required – COMM 350, 351, 352, 353

Recommended – COMM 317

Entertainment Studies

Required – COMM 346, 446

Recommended – COMM 334, 335

Journalism

Required – COMM 372 or 471

Recommended – COMM 334, 335

Photocommunications

Required – COMM 317, 319, 321

Recommended – COMM 409

Public Relations

Required – COMM 361, 362.

Recommended – COMM 317, 363, 464

COMMUNICATIONS MINORS

The department offers three options for a communications minor for students NOT majoring in communications. Students majoring in communications cannot minor in communications.

MINOR IN ADVERTISING (21 UNITS)

COMM 233 Mass Communications in Modern Society (3)

COMM 350 Principles of Advertising (3)

COMM 352 Advertising Media (3)

COMM 353 Creative Strategy and Execution I (3)

COMM 451A, B or C Advertising Campaigns (3)

Plus 6 units, approved by two advisers, from – COMM 380, 407, 415T, 425, 450, 452, 453, 455, 457 or 480.

MINOR IN JOURNALISM (21 UNITS)

Required courses for a Minor in Journalism must be taken in sequence. Each course builds upon the other. The three required journalism courses provide a core of information for beginning journalism students.

COMM 233 Mass Communications in Modern Society (3)

COMM 101 Writing for the Mass Media (3)

COMM 201 Reporting for Mass Media I (3)

COMM 202 Reporting for Mass Media II (3)

Plus three units from – COMM 310, 407 or 425

Print Journalism Track

COMM 471 News Media Production (3)

Plus three units from – COMM 331, 332, 334, 335, 380, 434, 435, 436, 437, 438T

Broadcast Journalism Track

COMM 372 Television News Production (3)

Plus three units from – COMM 331, 334, 335, 371, 380, 435, 436, 438T, 472

MINOR IN PUBLIC RELATIONS (21 UNITS)

The minor in Public Relations offers students the opportunity to engage in a systematic program of study in the field of public relations, to complement their major field of study.

COMM 101 Writing for Mass Media (3)

COMM 233 Mass Communications in Modern Society (3)

COMM 361 Principles of Public Relations (3)

COMM 362 Public Relations Writing (3)

COMM 464 Public Relations Management (3)

Plus two courses from – COMM 407, 410, 425, 465, 467, 468, 469, 470, 480, 497T

MASTER OF ARTS IN COMMUNICATIONS (30 UNITS) (MASS COMMUNICATIONS RESEARCH AND THEORY)

In order to be admitted into the Masters of Arts in Communications program with a Concentration in Mass Communications Research and Theory, each applicant must have a baccalaureate from a four-year accredited institution, a minimum undergraduate GPA of 3.0 for the last 60 units of study and a minimum GRE score to meet university requirements with a minimum of 500 on the verbal portion. If the preparatory work was in a language other than English, a minimum TOEFL score of 550 (paper), 213 (computer) or 79-80 (Internet-based) is required as well. The following courses or their equivalents must be completed before undertaking graduate courses:

- Communications Writing (COMM 201, 301, 351 or 362)
- Introductory course in communications or area of specialty (COMM 233, 332, 350 or 361)
- COMM 410 Principles of Communication Research

Note: Undergraduate prerequisite courses must be completed and do not count toward the graduate degree.

University writing requirements must be met as described on the Graduate Studies Web site: <http://www.fullerton.edu/graduate/general.htm>

A study plan must be filed before the first nine units of course-work are completed.

MASTER OF ARTS IN COMMUNICATIONS (30 UNITS) (PROFESSIONAL COMMUNICATIONS)

In order to be admitted into the Masters of Arts in Communications program with a Concentration in Professional Communications, each applicant must have a baccalaureate from a four-year accredited institution, a minimum undergraduate GPA of 2.75 for the last 60 units of study and a minimum GRE score to meet university requirements with a minimum of 500 on the verbal portion. If the preparatory work was in a language other than English, a minimum TOEFL score of 550 (paper), 213 (computer) or 79-80 (Internet-based) is required as well. At least one year of professional experience related to the field of communication is required. The following courses or their equivalents must be completed before undertaking graduate courses:

- Communications Writing (COMM 201, 301, 351 or 362)
- Introductory course in communications or area of specialty (COMM 233, 332, 350 or 361)
- COMM 410 Principles of Communication Research

Note: Undergraduate prerequisite courses must be completed and do not count toward the graduate degree.

Graduate Standing – Classified

A student admitted in conditionally classified standing may be granted classified standing upon the development of an approved study plan and satisfactory completion of prerequisite coursework. Satisfactory coursework or its equivalent in the following may be taken concurrently with degree requirements if not completed prior to classification:

- Communications writing (COMM 201, 301, 351 or 362)
- Introductory course in communications (COMM 233, 332, 350 or 361)
- COMM 410 Principles of Communication Research (3)

Study Plan

Students are required to complete their approved studies with a minimum grade-point average of 3.0, including 21 units in 500-level communications courses. A maximum of nine units may comprise 400-level courses appropriate to the student's area of interest.

The candidate must develop a program of study in consultation with a Department of Communications graduate adviser. The candidate must plan the thesis (6 units) or project (3 units) with a committee. The committee includes at least two faculty members from the Department of Communications.

COMMUNICATIONS COURSES

Courses are designated as COMM in the class schedule.

101 Writing for Mass Media (3)

Prerequisites: ENGL 101 or equivalent with a "C" (2.0) or better; typing ability. Principles and practices of writing for major types of mass communications media. Content, organization, conciseness and clarity (2 hours lecture, 2 hours laboratory).

201 Reporting for Mass Media I (3)

Prerequisite: COMM 101 or equivalent. Develop expertise in news reporting, including computer-assisted reporting and writing techniques, with an emphasis on print and Web reporting and writing. Students will have an opportunity to write for the Daily Titan.

202 Reporting for Mass Media II (3)

Prerequisite: COMM 101. Develop expertise in advanced news reporting and writing techniques, with an emphasis on the Web, radio and television. Learn basics of visual journalism storytelling, including basic elements of shooting videotape, recording audio, editing video and audio tape, and building news websites. Opportunities to contribute to the Daily Titan, Titan Online and/or OC News will be provided.

233 Mass Communication in Modern Society (3)

Prerequisite: completion of General Education (G.E.) Category D.1. Newspapers, magazines, films, radio and television; their significance as social instruments and economic entities in modern society. One or more sections offered online.

300 Visual Communication (3)

Prerequisite: completion of G.E. Categories C.1 or C.2. Social and cultural analysis of the meaning, production and consumption of visual information in a modern media society. Still, moving, television, graphic design, cartoon and computer images will be analyzed in terms of technical, commercial and cultural considerations. Must pass with at least a "C" (2.0). One or more sections offered online.

301 Writing for Broadcasting and Film (3)

Prerequisites: ENGL 101 or equivalent with a "C" (2.0) or better; typing ability. Theory and principles of writing in the broadcast and film media. (2 hours discussion, 1 hour activity)

310 Mass Media Ethics (3)

Prerequisite: junior standing. Moral and professional conduct within various communications contexts. Examine cases involved with advertising, broadcast journalism, film, photojournalism, print journalism, public relations, television and the World Wide Web. One or more sections offered online.

315 Mass Media and Ethnic Groups (3)

Representations of various ethnic and racial groups in advertising, news, film and television. Become more critical consumers of the media.

317 Digital Foundations (3)

Prerequisite: completion of G.E. Category C.1 or C.2. Convergence of the basic principles and practices of digital photography, digital imaging, graphic design and webpage production for creative visual problem solving.

319 Visual Reporting (3)

Prerequisite: COMM 317. Image creation for publication in print and/or screen media. Convergence of the basic principles and practices of digital photography, digital imaging, graphic design and webpage production for journalism-based visual problem solving. (2 hours lecture, 3 hours laboratory)

321 Studio Photography (3)

Prerequisite: COMM 317. Creative and effective use of images in print and/or screen publications within advertising, public relations, entertainment studies and other commercial, persuasive communication contexts. (2 hours lecture, 3 hours laboratory)

331 News Literacy (3)

Where information comes from and how to evaluate its credibility, truth and accuracy through critical examination. Topics include newsgathering and presentation, and differences among news, opinion, advertising, public relations and entertainment.

332 Editing and Design (3)

Prerequisite: COMM 201. Principles and practice of newspaper editing: copy improvement, headline writing, news photos and cutlines, wire services, typography, copy schedules and control, page design and layout, law and ethics. (2 hours lecture, 3 hours laboratory)

333 Mass Media Effects (3)

Prerequisite: completion of G.E. Category D.1. The role mass media communications play in all human activity with heavy emphasis on the effects of mass media on the political, social and economic fabric of America.

334 Feature Article Writing (3)

Prerequisite: COMM 101 with a "C" (2.0) or better. Nonfiction writing for newspapers and magazines; sources, methods and markets.

335 Public Affairs Reporting (3)

Prerequisite: COMM 201 with a grade of "C" (2.0) or better. COMM 407 recommended. Reporting public interest news such as courts, education, finance, government, police and urban problems.

439 Literacy Journalism (3)

Prerequisite: COMM 334. Literary journalism in theory and practice. The works of literary journalism, elements of the genre and its historical development. Student will produce two major projects during the semester.

341 Film-TV Industry (3)

(Same as RTVF 341)

346 Introduction to Entertainment and Tourism Studies (3)

Introduction to the entertainment industry. Apply entertainment and persuasion theory. Learn about career opportunities in entertainment-related fields. Explore tasks, skill sets, demands and rewards associated with different entertainment professions. (Same as THTR 346)

350 Principles of Advertising (3)

Functions, strategies, ethics, technology and media relevant to the advertising industry, as well as concepts in international, intercultural and integrated marketing communication.

351 Writing for the Advertising Industry (3)

Prerequisite: ENGL 101. Develop written communications and critical thinking skills essential for success in all advertising-related careers. Compose persuasive letters, reports, proposals and news releases. Grammar and language skills. Students must achieve a "C" (2.0) or better to continue taking advertising courses. (2 hours lecture, 2 hours laboratory)

352 Advertising Media (3)

Prerequisites: COMM 350 and junior standing. Plan, execute and control advertising media programs. Basic data and characteristics of the media. Buying and selling process, techniques and methods in media planning process. Audience measurement and media analysis.

353 Advertising Creative Strategy and Execution I (3)

Prerequisites: ENGL 101, COMM 350, and junior standing. Write copy and lay out advertisements, based on study of sales appeals, attention factors and illustrations. (2 hours lecture, 2 hours activity)

361 Principles of Public Relations (3)

Prerequisite: junior standing. Social, behavioral, psychological, ethical, economic and political foundations of public relations, and the theories of public relations as a communications discipline. One or more sections offered online.

362 Public Relations Writing (3)

Prerequisites: COMM 101 and 361, both with a grade of "C" (2.0) or better; junior standing; typing ability. Communications analysis, writing for business, industry and nonprofit organizations. Creating effective forms of public relations communication.

371 Radio News Production (3)

Prerequisite: COMM 202. Writing, producing, planning, taping, editing and evaluating radio news.

372 TV News Production (3)

Prerequisite: COMM 202. Writing, production and evaluation of television news. Discussion of TV reporting techniques and problems. Cover events and produce TV news in lab. (2 hours lecture, 2 hours lab)

380 Interactive Media Design (3)

Prerequisite: COMM 317. Underlying design concepts and production techniques for creating interactive multimedia presentations for educational lessons, commercial applications and online publications.

407 Communications Law (3)

Prerequisites: COMM 233 and junior standing. Anglo-American concept of freedom of speech and press; statutes and administrative regulations affecting freedom of information and publishing, advertising and telecommunication. Libel and slander, rights in news and advertising, contempt, copyright and invasion of privacy. One or more sections offered online.

409 Advanced Visual Reporting (3)

Prerequisite: COMM 319. Advanced visual reporting. Extensive use of cameras for photographic reporting; evaluation and preparation of pictures for publication for both print and screen media. Field/laboratory experience in digital photography and processing. (2 hours lecture, 3 hours laboratory)

410 Principles of Communication Research (3)

Prerequisites: COMM 233 and junior standing. Research methods used to assess the effects of print, broadcast and film communications on audience attitudes, opinions, knowledge and behavior. Research design and data analysis in communications research.

415T Current Issues in Advertising (3)

Prerequisites: COMM 233, 350 or 361; permission of instructor. Variety of current advertising topics in all fields of communications. Professional problems, global issues, critical analysis and special skills are presented to supplement the curriculum and enhance the understanding of, and appreciation for, advertising concepts.

421 Advanced Studio Photography (3)

Prerequisite: COMM 321. Students will prepare an advanced portfolio of images for print and/or screen publications that demonstrates their ability to produce professional quality illustrative assignments within advertising, public relations, entertainment studies and other commercial, persuasive communication contexts. (2 hours lecture, 3 hours laboratory)

422 Communications Technologies (3)

Prerequisite: COMM 233. Issues surrounding communications technologies. Recent developments in technology, impact of government, industry and economic factors, historical overview and implications for social change. Technological developments. Applications to all areas of mass communications.

425 History and Philosophy of American Mass Communication (3)

Prerequisites: COMM 233 and junior standing. American mass communication; newspapers and periodicals through radio and television; ideological, political, social and economic aspects. Not available for graduate degree credit. One or more sections offered online.

426 Global Media Systems (3)

Prerequisites: COMM 233 and junior standing. Major mass communication systems, both democratic and totalitarian, and the means by which news and propaganda are conveyed internationally.

433 Working in the Magazine Industry (3)

Prerequisite: COMM 233. Overview of the inner working of the magazine industry. How the magazine industry functions and what is involved in the creation and production of magazines.

434 Magazine Editing and Production (3)

Prerequisite: COMM 201. Students produce Tusk, the magazine of Cal State Fullerton, and learn about the dynamics of magazine production and the magazine industry. Students work together in a professional setting to produce a high quality magazine.

435 Opinion Writing (3)

Prerequisites: ENGL 101 or equivalent with a grade of "C" (2.0) or better, upper-division writing course, and junior standing. Techniques of editorial writing and opinion writing, including personal essays, for print, broadcast and Internet. Role of punditry in television news and on TV and radio talks shows, and how this might affect public perceptions of the media.

436 Reporting on the Entertainment Industry (3)

Prerequisite: COMM 101. Developing expertise in reporting and writing on the entertainment industry. Understanding the economics, business models, legal aspects and culture of the industry.

437 Advanced Magazine Writing (3)

Prerequisite: COMM 334. Practical experience in reporting and writing long, in-depth feature articles for professional magazines. Challenges of researching and writing for specialized audiences and the business of freelancing. Techniques for improving clarity, brevity, cohesion and emphasis.

438T Specialized Reporting (3)

Prerequisite: COMM 201 or 202. Varied topic course designed to teach advanced reporting and writing skills in specialized areas. Combine an awareness of techniques and resources with an abundance of writing models and field experiences.

444 Capstone for Visual Communications (3)

Prerequisites: COMM 319, 321 or 380. Synthesize skills in interactive media design, studio photography and visual reporting. Work individually and in collaboration to produce a visual culture research paper, an individual skills-based project and a collaborative visual research project.

446 Entertainment and Society (3)

Prerequisites: COMM 233; COMM/THTR 346 or MGMT 365. In-depth exploration of the role of entertainment in modern society. Audience uses, motivations and individual preferences for entertainment. Theories and research regarding the form and function of entertainment and entertainment media.

447 Tourism and Travel (3)

Prerequisites: COMM 346, 350, 361, MGMT 339, MKTG 351 or THTR 200. Concepts, tools and techniques necessary for understanding the tourism and travel industry and its promotional communications. Trends and issues of tourism and travel and the unique problems and opportunities of this field. One or more sections offered online.

448T Entertainment Industry Studies (3)

Prerequisites: COMM 233; COMM/BUAD/THTR 346. Variable topics course focusing on specific entertainment industries, issues, organizations, trends and/or functions. May be repeated twice with a different topic.

449 Capstone in Entertainment and Tourism Studies (3)

Prerequisite: COMM 346 or equivalent. Prepares for careers in the entertainment industry by combining theory with applied principles and analytical skills in examining and developing case studies. Students plan and execute their own campaigns and projects. One or more sections offered online. (Same as THTR 449)

450 Advertising and Brand Communication Management (3)

Prerequisites: COMM 352, 353. Theory and techniques for planning, directing and evaluating advertising and brand communication programs, with emphasis on media-message strategies. Managerial approach with case studies to the solution of brand communications problems.

451A Advertising Campaigns – AAF Competition (3)

Prerequisites: COMM 350, 352, 353 and consent of instructor. Advertising campaigns, including applied research, writing and utilization of print and electronic mass media. Design of complete campaigns from idea to prediction readiness. Must pass with at least a “C” (2.0).

451B Advertising Campaigns – Local Focus (3)

Prerequisites: COMM 350, 352, 353. Advertising campaigns, including applied research, writing and utilization of print and electronic mass media. Design complete campaigns from idea to prediction readiness. Must pass with at least a “C” (2.0).

451C Advertising Campaigns – TitanCom Agency (3)

Prerequisites: Advertising majors – COMM 350, 352, 353; Public Relations majors – COMM 361, 362. Advertising campaigns, including applied research, writing and utilization of print and electronic mass media. Design complete campaigns from idea to prediction readiness. Must pass with at least a “C” (2.0).

452 Advanced Media Strategy and Tactics (3)

Prerequisite: COMM 352. Further education in advertising media. Integrate theories from related disciplines, such as communications, marketing and psychology to illustrate better ways to use media as a competitive tool in business.

453 Advertising Creative Strategy and Execution II (3)

Prerequisites: COMM 350, 353 and 317 or 358. Advanced advertising projects involving application and execution of creative advertising strategies for mass media, including theory and practice of writing copy, and preparing comprehensive layouts and completed scripts. Group discussions, labs and individual conferences.

454 Advertising Media Sales (3)

Prerequisites: COMM 350 and 353; or COMM 332 and either 217 or 358; or MKTG 351 and any 300-level graphics, layout or design course. Prepares for careers in advertising media sales, including radio, television, newspaper, magazine, new media and the Internet. Personal sales techniques and media sales strategies are presented for each medium.

455 Internet Advertising and Promotional Communications (3)

Prerequisites: COMM 350, 352, 353. Internet advertising and marketing issues and ideas. Evaluate, develop and execute Internet-based advertising and promotional campaigns.

456 Advertising Account Planning (3)

Prerequisites: COMM 353, 410. Apply principles of research, consumer behavior and creative concept development to advertising and brand communication campaigns. Field study and case application facilitate the process of the planner’s consumer advocacy function.

457 Broadcast Advertising (3)

Prerequisites: COMM 350, 353, junior standing. Theoretical and practical exposure to the field of broadcast advertising from an agency perspective, including positioning, creative brief writing, strategy, script development and analysis, storyboarding and pitching.

464 Public Relations Management (3)

Prerequisites: COMM 361, 362 and junior standing. Analyze systems and strategies for planning public relations campaigns and solving/preventing problems. Individual, team case studies, in corporate development of proposals; actual use of tools in addition to role playing presentations to management. Must pass with at least a “C” (2.0).

465 Entertainment Public Relations (3)

Prerequisites: COMM 361 or COMM/THTR 346. Public relations strategies and tactics as used in the entertainment industry, including media relations, talent relations, special events, high visibility techniques, presentation and dealing with adverse situations.

467 Public Relations Agency Seminar (3)

Prerequisites: COMM 101, 361 and junior standing. Psychology and functions of client counseling, proposal writing, new business development, agency management, servicing clients, evaluation of methods, reporting results, and legal and ethical concerns.

468 Corporate and Nonprofit Public Relations (3)

Prerequisites: COMM 101 and 361. Public relations strategies and tactics used in today's increasingly sophisticated and maturing corporate and nonprofit marketplaces. This advanced course, which relies heavily on professional guest speakers and in-class simulations/exercises, encompasses a host of specific topics, such as fundraising, corporate and social responsibility, media relations, and technology and ethical issues.

469 Crisis Communications (3)

Prerequisites: COMM 233, junior standing. Practical experience in preparing for and responding to crisis situations across a wide variety of contexts. Theory and practice of organizational issue management, crisis planning and crisis response. Current and future challenges of issue/crisis management.

471 News Media Production (3)

Prerequisites: COMM 201, 319, 321 or 380. Class members constitute the editorial staff of the university newspaper and receive training in print, online and magazine-style journalism. Meets four hours per week for critiques in news reporting, writing, editing and makeup, followed by production. (More than 9 hours laboratory)

472 Advanced Electronic News Production (3)

Prerequisite: COMM 372. Advanced news writing and production for television, radio and web. Students develop their electronic news production skills by working on "OC News," daily television, radio and web newscasts. (2 hours lecture, 3 hours laboratory) May be repeated once for credit.

480 Persuasive Communications (3)

Prerequisites: COMM 233 and junior standing. Persuasive communications applied to mass communication. The communicator, audience, message content and structure, and social context in influencing attitudes, beliefs and opinions.

481 Advanced Interactive Media Design (3)

Prerequisite: COMM 380. Interactive media design for various platforms and design topics such as interactive narratives, experience design, usability and accessibility and productive interaction. Students will learn to use current interactive media protocols to develop projects for interactive audiences.

495 Mass Media Internship. (3)

Prerequisites: senior standing; communications major; 2.25 GPA overall and in major.; For specific prerequisites for each concentration, visit: <https://commrtvfinternship.fullerton.edu>. Supervised internship according to concentration. Selected from a wide variety of communications media, industries, agencies and nonprofit organizations. Applications must be made through the department coordinator one semester prior to entering the program. See the department section titled "Internship Requirements" in this catalog or the internship website. (Credit/No Credit Only)

496 Student-to-Student Tutorial (1-3)

Prerequisites: consent of instructor and previous superior performance in a similar or equivalent course. Under faculty supervision, provides tutorial assistance in a communications course. May involve small group demonstrations and discussions, individual tutoring and evaluation of student performance as appropriate. May be repeated for a maximum of four units either separately or in combination with COMM 499.

497T Event Planning and Management (3)

Prerequisite: one of the following: COMM 361, 346 or 350, or BUAD 301 or 346. Plan, produce and promote public events to meet communication objectives. Hands-on applications to COMM Week, film festivals or other events. May be repeated once for extra elective units only.

499 Independent Study (1-3)

Prerequisite: consent of department chair. Individually supervised mass media projects and research on campus and in the community. May involve newspaper and magazine publishers, radio and television stations, and public relations agencies. May be repeated up to a maximum of four units either separately or in combination with COMM 496.

500 Theory and Literature of Communications (3)

Prerequisite: conditional classified status. Theories and research on communication processes and effects; source, media, message, audience and content variables; types, sources and uses of communication literature. Graduate seminar.

507 Communications Research Design and Analysis (3)

Pre- or corequisite: COMM 500. Develops a working knowledge of data collection and analysis techniques in both quantitative and qualitative research methods. Material and presentation are developed for practical application to all professional fields of communication.

508 Humanistic Research in Communications (3)

Prerequisites: COMM 410 and 500. Humanistic methods of study in communications: historical research and critical analysis applied to problems, issues and creative works in communication. Graduate seminar.

509 Social Science Research in Communications (3)

Prerequisites: COMM 410 and 500. Social-scientific research design and analysis and the study of communication processes and effects. Graduate seminar.

515T Professional Problems in Specialized Fields (3)

Prerequisite: COMM 500. Selected topics and issues in the field of mass communications. Subjects vary each semester. May be repeated with a different topic.

516 Media Audience Behavior (3)

Prerequisite: COMM 500. In-depth analysis of the types, attitudes and behaviors of media audiences. Theories from psychology, marketing, anthropology and communications are integrated for comprehensive understanding of why people consume media and performance. Appropriate for all Communications disciplines.

517 Ethical Problems of the Mass Media (3)

Prerequisite: COMM 500. Criticisms of specific functions of the mass media and public relations. Consists of three sections: history of criticism; problem areas of the media; and practitioner response to criticism. Offered online only.

518 Public Relations Theory (3)

Prerequisite: COMM 500. Cutting edge communication and organizational theories and vital emerging issues influencing the field of public relations. Special focus on contemporary public relations models and practitioner roles. One or more sections offered online.

519 Communications and Governance in America (3)

Prerequisite: COMM 500. Relationships between systems of communications, particularly new communication technologies, and governmental institutions and processes within the American setting. How technological change relates to patterns of decision-making, management and the content and flow of information among public officials.

520A News-Editorial (3)

Prerequisites: COMM 500 and six units of study plan courses in area of specialization. Under supervision of a faculty member, plan, design, conduct and evaluate a team project in their field of specialization.

520B TV/Film (3)

Prerequisites: COMM 500 and six units of study plan courses in area of specialization. Under supervision of a faculty member, plan, design, conduct and evaluate a team project in their field of specialization.

520C Public Relations (3)

Prerequisites: COMM 500, 518 and six units of study plan courses in area of specialization. Under supervision of a faculty member, plan, design, conduct and evaluate a team project in their field of specialization.

525 Advanced Communications Management (3)

Prerequisite: COMM 500. Up-to-date assessment of general management and communications management techniques, and helps equip for management positions in advertising, journalism, public relations and broadcasting.

527 Politics and Mass Media (3)

Prerequisite: COMM 500. Nature of the relationship between the mass media and politics. Particular attention to the role and impact of the mass media in political election campaigns and policy making.

530 Communications Technologies (3)

Prerequisite: COMM 500. Emerging communications technologies that are transforming professional practices associated with various communications industries. Recent technological developments, corporate and government policies affecting their use, and social consequences of current and projected applications. One or more sections offered online.

534 American Media History (3)

Prerequisite: COMM 500. History of American mass media, from McCarthy to the present – a period that marked the birth of television and the maturation of investigative journalism in shaping American attitudes about government and society.

536 International Communications (3)

Prerequisite: COMM 500. Comparative examination of communications policies and practices in different national settings. Provides future practitioners with an understanding of cross-national variations in communication policies and how they shape communication industries and practices.

541 Film Criticism (3)

Prerequisite: COMM 500. Graduate foundation course in screenwriting that examines methods of evaluating and critiquing motion picture screenplays and films for a variety of Hollywood genres.

550 Advertising in Modern Society (3)

Prerequisite: COMM 500. Assessing the impact of advertising on society, the culture and economy. Philosophical rather than technical examinations of critical issues and problems, such as economic and social effects of advertising, effects of value and life styles, ethics and regulation.

595 Graduate Mass Media Internship (3)

Prerequisites: COMM 500, and COMM 508 or 509, and consent of graduate adviser. Supervised practical work experience with media outlets, advertising and promotion agencies, public relations firms, film companies, etc. Involves cooperative efforts of departmental faculty and employers. Exposure to current and innovative techniques in research, management and creative activities while offering practical experience.

597 Project (3)

Prerequisite: consent of graduate coordinator. Completion of creative project in a sequence beyond regularly offered coursework.

598 Thesis (3 or 6)

Prerequisite: consent of graduate coordinator. Completion of a thesis in a sequence beyond regularly offered coursework.

599 Independent Graduate Research (1-3)

Prerequisite: consent of graduate coordinator. Individually supervised mass media projects or research for graduate students. May be repeated.