BIOLOGICAL SCIENCES
School of Life Sciences and Technologies

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Academic Chair: Priscilla Ross
Faculty: Daniel Aldana, MD, Robert Allen, PhD, Jayendra Bajracharya, Vince Caiozzo, PhD, Ingrid Chlup, Tom Engelhardt, David Fretz, Donna Friedman, PhD, Vanessa Gutierrez, Diana Hurlbut, PhD, Jefferey Kaufmann, PhD, Emalee Mackenzie, Pam Moniz, Michelle Palmisano, PhD, Edward Paz, Michelle Priest, Christopher Riegel, PhD, Roland Rodriguez, Priscilla Ross, Stephen Runyan, PhD, Katherine Schmeidler, PhD, Erica Sharar, Sandra Watt, Julie Wells, Tonny Witje, PhD

Curriculum
The School of Life Sciences at Irvine Valley College offers a wide range of courses in the biological sciences as well as a course in environmental studies. Introductory courses focus on theories and concepts in five primary areas: cellular and molecular biology, genetics, evolution, ecology, and whole organism biology. More specialized courses examine extensions of these basic principles as they relate to a variety of specific areas of study, including botany, zoology, human anatomy, human physiology, cellular biology, microbiology, natural history, and marine biology.

Students may complete courses within the department in order to fulfill general education requirements, to satisfy prerequisites for health-related programs such as nursing, to meet graduation requirements at prospective transfer institutions, or to complete the Associate in Arts degree with a major in biology or health sciences.

Major
The requirements for majors in the life sciences are intended to provide a solid foundation for the student who wishes to pursue further study at the baccalaureate or graduate level, or enter a preprofessional or professional program in a health-related field. The faculty strongly recommends that students without a firm foundation in basic biological principles complete one of the two introductory sequences in biology (Biology 1/1L or Biology 94/94L) in preparation for the more specialized courses. In addition to the core courses for the major or health-related fields, an introduction to other sciences is usually recommended and necessary for more advanced study. The biology faculty therefore suggests that students complete appropriate courses in chemistry, physics, and mathematics concurrently with biology core courses. Students should refer to the requirements of prospective institutions or seek advice from a member of the biology faculty or a counselor before choosing electives.

Career Options
An A.A. degree in biology will prepare students for entry into certificate or technical training programs in:

• Nursing
• Biotechnology
• Dental Assisting
• Dental Hygiene
• Emergency Medical Technology
• Paramedic Training
• Laboratory Research

An A.A. degree in biology will also allow students to continue their education at a four-year institution, where earning a B.A. degree in biological sciences can prepare them for careers in:

• Public Health
• Nutrition
• Biotechnology
• Laboratory and Field Research
• Pharmaceutical Sales
• Land Management
• Environmental Studies
• Entry into professional schools that provide training in medicine, dentistry, pharmacy, optometry, physician’s assistant, and veterinary medicine

Associate Degree
Associate in Arts Degree in Biology
Associate in Arts Degree in Health Sciences

Students must complete a minimum of 60 units of credit, including the courses in the major (“Major Requirements”) and general education requirements (pages 43-49), with an overall GPA of 2.0 or better, and a grade of “A,” “B,” “C,” or “P” in all courses to be counted toward the major. A minimum of 12 units must be completed at Irvine Valley College. See pages 34-35 for further information.

Transfer Preparation
Courses that fulfill major requirements for an associate degree at Irvine Valley College may not be the same as those required for completing the major at a transfer institution offering a bachelor’s degree. Students who plan to transfer to a four-year college or university should schedule an appointment with an IVC counselor to develop a plan of study before beginning their program. It may be helpful to meet with the department faculty at IVC.
**Associate in Arts Degree**  
**Major Requirements: BIOLOGY**

**Complete the following courses:**  

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 2</td>
<td>4</td>
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<tr>
<td>BIO 5</td>
<td>4</td>
</tr>
<tr>
<td>BIO 6</td>
<td>3</td>
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<tr>
<td>BIO 6L</td>
<td>1</td>
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<td>OR</td>
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<tr>
<td>BIO 93</td>
<td>4</td>
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<tr>
<td>BIO 94</td>
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<tr>
<td>BIO 94L</td>
<td>1</td>
</tr>
<tr>
<td>BIO 97</td>
<td>3</td>
</tr>
<tr>
<td>BIO 99</td>
<td>3</td>
</tr>
<tr>
<td>BIO 99L</td>
<td>1</td>
</tr>
</tbody>
</table>

Select 3–6 units from the following courses to complete a total of 18 units.  
No more than 2 units may be selected from field courses/lab research courses:  

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 4</td>
<td>3</td>
</tr>
<tr>
<td>BIO 11</td>
<td>4</td>
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<tr>
<td>BIO 12</td>
<td>4</td>
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<tr>
<td>BIO 15</td>
<td>5</td>
</tr>
<tr>
<td>BIO 19</td>
<td>4</td>
</tr>
<tr>
<td>BIO 30</td>
<td>3</td>
</tr>
<tr>
<td>BIO 44</td>
<td>3</td>
</tr>
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<td>BIO 13</td>
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</tr>
<tr>
<td>BIO 101</td>
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</tr>
<tr>
<td>BIO 103</td>
<td>1</td>
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<td>BIO 104</td>
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</tr>
<tr>
<td>BIO 110</td>
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<tr>
<td>BIO 140</td>
<td>1.5</td>
</tr>
<tr>
<td>CHEM 1A</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 1B</td>
<td>5</td>
</tr>
</tbody>
</table>

**TOTAL UNITS:** 18

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**Associate in Arts Degree**  
**Major Requirements: HEALTH SCIENCES**

This major is appropriate for students who plan to enter training in one of the health professions, including nursing, physical therapy, occupational therapy, dental hygiene, physician assisting, and health sciences.

**Complete the following courses:**  

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 11</td>
<td>4</td>
</tr>
<tr>
<td>BIO 12</td>
<td>4</td>
</tr>
<tr>
<td>BIO 15</td>
<td>5</td>
</tr>
</tbody>
</table>

**Complete a minimum of 6 units from the following courses. Select one chemistry course:**  

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 10</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 4</td>
<td>5</td>
</tr>
<tr>
<td>† CHEM 108</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 1</td>
<td>3</td>
</tr>
<tr>
<td>SOC 1</td>
<td>3</td>
</tr>
</tbody>
</table>

**TOTAL UNITS:** 19

† Course offered only at Saddleback College

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**COURSES**

**BIO 1: THE LIFE SCIENCES**  
3 Units  
3 hours lecture  
Transfers: CSU, UC credit proviso (see UC course list)  
This course is an integrated survey of the major principles of biology. Students focus on cellular and molecular biology, biochemistry, reproduction, genetics, evolution, population biology, and ecology. This course is recommended for students seeking to fulfill the general education requirement in life sciences or as an introductory course for students pursuing advanced study in life sciences. NR

**BIO 1L: THE LIFE SCIENCES LABORATORY**  
1 Unit  
3 hours lab  
Transfers: CSU, UC  
Prerequisite: CSU, UC  
This is a laboratory survey of the major principles of biology. It is the recommended course to accompany Biology 1. Topics include the application of laboratory equipment and procedures to the investigation of biological systems at the biochemical, cellular, organismal, population, and community levels. This course does not include animal dissections. Students may take Bio. 1L independently or concurrently with the Bio. 1 lecture, but not prior to it. Field trips may be required to fulfill the course objectives. NR

**BIO 2: PRINCIPLES OF BOTANY**  
4 Units  
3 hours lecture, 3 hours lab  
Transfers: CSU, UC  
Prerequisite: Bio. 1 or Bio. 94 and Math 253  
This course provides a survey of plants, algae, fungi, and prokaryotes. Lectures focus on the structure, function, genetics, classification, evolution, ecology and natural history of these major groups. Field trips may be required to fulfill course objectives. NR
BIO 4: EVOLUTIONARY ECOLOGY
3 Units
3 hours lecture
Transfers: CSU, UC
Prerequisite: Bio. 94
This course examines the interactions between organisms and their abiotic and biotic environments from an ecological and evolutionary perspective. The focus is on global and local climatology; adaptations to the physical environment; energy production and utilization; food chains and food web analysis; niche theory; biology of populations, including population growth and its regulation, and interactions between and within populations; analysis of community structure and functions; life history; natural and sexual selection, adaptation and genetics; mating systems; problems of spatial and temporal scale; and game theory. This course assumes some knowledge of organismal biology and evolutionary theory. NR

BIO 5: PRINCIPLES OF ZOOLOGY
4 Units
3 hours lecture, 3 hours lab
Transfers: CSU, UC
Prerequisite: Math 253
This course is a survey of protozoans and animals. Lectures focus on the structure, function, development, classification, evolution, ecology and natural history of major animal and protozoan groups. Field trips may be required to fulfill the course objectives. NR

BIO 6: CELLULAR BIOLOGY
3 Units
3 hours lecture
Transfers: CSU, UC
Prerequisite: Bio. 1, Chem. 1B and Math 253
This course presents an analysis of living systems at the cellular level. It examines the structure and function of prokaryotic and eukaryotic cells and their organelles; the energetics and biochemistry of metabolism; the processes of intracellular transport; and the process of protein synthesis. NR

BIO 6L: CELLULAR BIOLOGY LABORATORY
1 Unit
3 hours lab
Transfers: CSU, UC
Prerequisite: Prior completion of or concurrent enrollment in Bio. 6
This course is the laboratory companion to the Biology 6 lecture course. It is designed to introduce students to the techniques of modern cell biology as they relate to the study of intracellular structure and function, genetic expression and transmission, and cell-environment interactions. Techniques may include organelle and macromolecule isolation and purification; chromatography; electrophoresis; Western blots; spectrophotometry; enzymology; histology; cytochemistry; gene transfer; polymerase chain reaction; DNA fingerprinting; immunology and cell culture and cloning. Biology 6L is also listed as Biology 99L; credit will be given in either area, not both. NR

BIO 10: BIOCHEMISTRY FOR HEALTH SCIENCES
4 Units
3 hours lecture, 3 hours lab
Transfers: CSU, UC
Prerequisite: Prior completion of or concurrent enrollment in Bio. 6
This course addresses the application of chemical principles to biological systems, especially at the cellular level of structure and function. Essential topics include the nature of biologically important solutions and colloids; structure, functions and interactions of biological macromolecules; interactions of biological molecules in formation and functions of biological membranes; intracellular metabolism and enzyme functions; and genetic control of biological functions. The course is intended for health science students who have no previous background in sciences. NR

BIO 11: HUMAN ANATOMY
4 Units
2 hours lecture, 6 hours lab
Transfers: CSU, UC
This course presents an analysis of human structure integrating cellular, tissue, organ, and organ system levels of structure and relates structure to function. Laboratory emphasis is on histology and gross anatomy. The course is designed for pre-professional students and biology majors. NR

BIO 12: HUMAN PHYSIOLOGY
4 Units
3 hours lecture, 3 hours lab
Transfers: CSU, UC
Prerequisite: Bio. 11 and either Bio. 10, Chem. 4, Chem. 12A, or Chem. 108
Recommended Preparation: Chem. 4, Wr. 1 and Math 253
This course applies an integrated systems approach to the study of function in the human body. Emphasis is on major organ systems, their negative feedback controls, and their significance in maintaining homeostasis of the whole body. Each system is analyzed at the molecular, cellular, tissue and organ levels of function. The lab component of the course emphasizes experimental design, data collection and analysis, and evaluation and interpretation of experimental results. NR

BIO 12D: HUMAN PHYSIOLOGY–DISCUSSION
1 Unit
1 hour lecture
Transfers: CSU, UC credit proviso (see UC course list)
Corequisite: Bio. 12
This discussion course affords students enrolled in Biology 12, Human Physiology, the opportunity to discuss, analyze, and exchange ideas concerning human function. Discussions focus on negative feedback control systems and other key topics covered in Biology 12, as well as background information not generally covered in the lecture. Biology 12D is offered on a pass/no-pass basis only. NR

BIO 13: LAB RESEARCH
2 Units
1 hour lecture, 3 hours lab
Transfers: CSU, UC
Prerequisite: Bio. 1, 2, 4, 5, 6, 11, 12, 15, 94, 97 or 99
Recommended Preparation: Chem. 1A/1B or Bio. 10; at least one other Biology course
This course provides laboratory and field experience for advanced students of biological sciences. It focuses on experimental design; equipment use and care; data collection, analysis, and interpretation; and both verbal and written presentation of results. R-E-3
BIO 15: GENERAL MICROBIOLOGY
5 Units
3 hours lecture, 6 hours lab
Transfers: CSU, UC
Recommended Preparation: Bio. 11 and Bio. 10
This course is an examination of the fundamental biological concepts as they apply to viruses, bacteria, fungi, and protozoans. Theoretical as well as practical applications are discussed in such topics as bacterial morphology, metabolism, genetics, chemotherapy, and antibiotics. Also discussed are resistance and immunity, health and disease, and the role of microorganisms in the environment. Laboratory work will reinforce topics covered in lecture. Field trips may be required to fulfill course objectives. NR

BIO 19: MARINE BIOLOGY
4 Units
3 hours lecture, 3 hours lab
Transfers: CSU, UC
Recommended Preparation: Bio. 1 or Bio. 94
This course presents the biology and natural history of marine organisms within an ecological context. A habitat approach emphasizes the physical features of each marine environment, the community structure of the habitat and adaptations of the constituent organisms. Emphasis is on California marine life. The laboratory component of the course emphasizes observation and experimentation. Experiments address general biological/ecological principles in the context of the marine environment. Students study the classification, anatomy, physiology and behavior of marine organisms. Field trips, an integral part of the course, focus on the structure of marine ecosystems. NR

BIO 30: CALIFORNIA WILDLIFE AND WILD PLACES
3 Units
3 hours lecture
Transfers: CSU, UC
This non-major lecture course introduces students to the natural history of California plants and animals in the context of the many ecosystems found in the state. The course presents both ecological and evolutionary perspectives as it examines the role of the environment, species interactions, and adaptation in creating California's surprising biodiversity. The course includes prehistorical and historical changes to California wildlands and the role humans have played in shaping the current landscape. Field trips may be required to fulfill course objectives. NR

BIO 43: WILD ANIMAL BEHAVIOR: THE SCIENCE OF ETHOLOGY
3 Units
3 hours lecture
Transfers: CSU, UC
This course offers an integrated analysis of the biological, ecological and evolutionary (i.e., adaptive) bases of animal behavior (ethology) in the wild. The course considers in detail the psychobiological, ecological, ontological and sociobiological determinants of animal behavior, stressing historical and evolutionary contexts. Field trips may be required to fulfill course objectives. NR

BIO 44: BIOLOGY OF HUMAN SEXUALITY
3 Units
3 hours lecture
Transfers: CSU, UC
Prerequisite: Bio. 10
This course integrates four broadly defined topics of evolutionary thought are integrated throughout. The course assumes prior knowledge of evolutionary theory, classification and taxonomy, and ecology. NR

BIO 45: INTEGRATED BIOLOGY: FROM DNA TO ORGANISMS
4 Units
4 hours lecture
Transfers: CSU, UC
Prerequisite: Math 253
Recommended Preparation: High school biology or chemistry
This course integrates four broadly defined levels of organismal structure and function into a coherent framework. Biochemistry, cell biology, genetics, and organismal structure and function (with emphasis on organ systems) are woven together using basics themes of structural-functional hierarchy, energetics, and information flow. NR

BIO 93: FROM ORGANISMS TO ECOSYSTEMS LABORATORY
1 Unit
3 hours lab
Transfers: CSU, UC
Prerequisite: Prior completion of or concurrent enrollment in Bio. 94
This laboratory course is a comprehensive survey of life’s diversity. The course examines species of organisms within the context of biological classification, biological nomenclature, environmental adaptation and evolutionary history. Students survey living specimens, museum specimens, herbarium specimens and microscope slides representing each of the major taxa. Field trips may be required to fulfill the course objectives. NR

BIO 94: FROM ORGANISMS TO ECOSYSTEMS
3 Units
3 hours lecture
Transfers: CSU, UC
Prerequisite: Chem. 1B and either Bio. 1 or Bio. 94
This course is a comprehensive survey of the processes and products of genetics. Through a review of experimental evidence, students evaluate the basic tenets of molecular, transmission, and population genetics, and use the science of genetics to appraise the relationship of genetics to the processes and products of microevolution and macroevolution. The philosophy and methods of science well as the theory of evolutionary thought are integrated throughout. The course assumes prior knowledge of evolutionary theory, classification and taxonomy, and ecology. NR
| Course Code | Course Title                                                                 | Units | Description                                                                                                                                                                                                 | Prerequisite | Transferable | Prep Notes                                                                 |
|-------------|------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------***************************************************************************|--------------|--------------|--------------------------------------------------------------------------|
| BIO 121:    | HUMAN ANATOMY AND PHYSIOLOGY                                                 | 4     | This basic course shows the interrelationships between the anatomical and physiological systems of humans.                                                                                             | High school  | CSU          | High school biology and eligibility for college-level writing          |
| BIO 140:    | LAB RESEARCH IN GEOLOGICAL AND BIOLOGICAL SCIENCES                           | 1.5   | This course provides laboratory and field experience for students of geological and biological sciences. It focuses on experimental design; equipment use and care; data collection, analysis, and interpretation; and verbal and/or written presentation of results. | Bio. 97 and Chem. 12A | CSU          | R-E-3                                                                    |
| BIO 200:    | HUMAN PROSECTION                                                            | 1     | This course focuses on the gross anatomy of major organs and organ systems of the human body. The course presents detailed regional dissections using human cadaveric specimens. | Bio. 99      | CSU          | R-E-3                                                                    |
| BIO 272:    | HUMAN GENETICS AND MEDICINE                                                  | 3     | This course offers an introduction to basic genetic concepts as they apply to humans. The course analyzes genetic pedigrees and hereditary relationships, genetic maps, genes, chromosomes, molecular aspects of human diseases and disorders related to genetics, and the role of databases including the Human Genome Project in forensics and medicine. | Bio. 97 and Chem. 12A | CSU          | R-E-3                                                                    |
| BIO 101:    | FIELD BIOLOGY: COASTAL MARINE ECOSYSTEMS                                     | 1     | This field course introduces students to interrelationships among plant/animal communities and physical environments that characterize coastal marine habitats. Topics will include natural history, biology and ecology of the flora and fauna and community structure and analysis. Introductory lectures complement direct field observations and field experiments, as well as the collection, analysis and interpretation of data. The course is taught entirely in the field. It is intended for both science majors and non-majors. A required course fee must be paid at or prior to the orientation session. | Bio. 99      | CSU          | R-E-3                                                                    |
| BIO 103:    | FIELD BIOLOGY: MOUNTAIN ECOSYSTEMS                                           | 1     | This field course introduces students to interrelationships among plant/animal communities and physical environments that characterize mountain habitats. Topics will include natural history, biology and ecology of the flora and fauna, and community structure and analysis. Introductory lectures complement direct field observations and field experiments, as well as the collection, analysis and interpretation of data. The course is taught entirely in the field. It is intended for both science majors and non-majors. A required course fee must be paid at or prior to the orientation session. | Bio. 99      | CSU          | R-E-3                                                                    |
| BIO 200:    | HUMAN PROSECTION                                                            | 1     | This course focuses on the gross anatomy of major organs and organ systems of the human body. The course presents detailed regional dissections using human cadaveric specimens. | Bio. 99      | CSU          | R-E-3                                                                    |
| BIO 272:    | HUMAN GENETICS AND MEDICINE                                                  | 3     | This course offers an introduction to basic genetic concepts as they apply to humans. The course analyzes genetic pedigrees and hereditary relationships, genetic maps, genes, chromosomes, molecular aspects of human diseases and disorders related to genetics, and the role of databases including the Human Genome Project in forensics and medicine. | Bio. 97 and Chem. 12A | CSU          | R-E-3                                                                    |

**BIOLOGY FIELD STUDIES**

| Course Code | Course Title                                                                 | Units | Description                                                                                                                                                                                                 | Prerequisite | Transferable | Prep Notes                                                                 |
|-------------|------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------***************************************************************************|--------------|--------------|--------------------------------------------------------------------------|
| BIO 101:    | FIELD BIOLOGY: COASTAL MARINE ECOSYSTEMS                                     | 1     | This field course introduces students to interrelationships among plant/animal communities and physical environments that characterize coastal marine habitats. Topics will include natural history, biology and ecology of the flora and fauna and community structure and analysis. Introductory lectures complement direct field observations and field experiments, as well as the collection, analysis and interpretation of data. The course is taught entirely in the field. It is intended for both science majors and non-majors. A required course fee must be paid at or prior to the orientation session. | Bio. 99      | CSU          | R-E-3                                                                    |
| BIO 103:    | FIELD BIOLOGY: MOUNTAIN ECOSYSTEMS                                           | 1     | This field course introduces students to interrelationships among plant/animal communities and physical environments that characterize mountain habitats. Topics will include natural history, biology and ecology of the flora and fauna, and community structure and analysis. Introductory lectures complement direct field observations and field experiments, as well as the collection, analysis and interpretation of data. The course is taught entirely in the field. It is intended for both science majors and non-majors. A required course fee must be paid at or prior to the orientation session. | Bio. 99      | CSU          | R-E-3                                                                    |

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**Courses | Programs | Departmental Majors**

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**Irvine Valley College Catalog 2009-2010**

www.ivc.edu 115
<table>
<thead>
<tr>
<th>COURSES</th>
<th>PROGRAMS</th>
<th>DEPARTMENTAL MAJORS</th>
</tr>
</thead>
</table>
| **BIO 104: FIELD BIOLOGY: DESERT ECOSYSTEMS**  
1 Unit  
.5 hours lecture, 1.5 hours lab  
Transfers: CSU  
Limitation: Students must be able to hike narrow desert trails and camp (tents, sleeping bags, cooking, limited showers)  
Recommended Preparation: An introductory college-level biology course and Wr. 1  
This field course introduces students to interrelationships among plant/animal communities and physical environments that characterize desert habitats. Topics will include natural history, biology and ecology of the flora and fauna and community structure and analysis. Introductory lectures complement direct observations and field experiments, as well as the collection, analysis and interpretation of data. The course is taught entirely in the field. It is intended for both science majors and non-majors. A required course fee must be paid at or prior to the orientation session. R-E-3 | **ENVIRONMENTAL STUDIES**  
**ENV 1: INTRODUCTION TO ENVIRONMENTAL STUDIES**  
3 Units  
3 hours lecture  
Transfers: CSU, UC  
This introductory course emphasizes an interdisciplinary approach to environmental science. It includes topics in biology, chemistry, geology, economics, health, and politics. Field trips will acquaint students with the local environment and the political process. NR | **BIO 110: FIELD BIOLOGY: ECOLOGY AND NATURAL HISTORY OF NATIONAL PARKS**  
2 or 4 Units  
1 hour lecture, 3 hour lab; or  
2 hours lecture, 6 hours lab  
Transfers: CSU  
Limitation: Students must be able to hike cross-country on narrow trails and camp (tents, sleeping bags, cooking, limited showers)  
Recommended Preparation: Introductory college-level biology and geology courses and Wr. 1  
This field course introduces students to interrelationships among plant/animal communities and the physical environment characteristic of selected national parks and monuments. Topics include natural history, biology and ecology of the flora and fauna, and community structure and analysis. Introductory lectures complement direct field observations and field experiments, data collection, and data analysis and interpretation. The course is taught entirely in the field. It is intended for both science majors and non-majors. A required course fee must be paid at or prior to the orientation session. R-E-3 |
| **BIO 109: FIELD BIOLOGY: A 21ST CENTURY LOOK AT THE AMERICAN WEST**  
2 or 4 Units  
1 hour lecture, 3 hours lab; or  
2 hours lecture, 6 hours lab  
Transfers: CSU  
Limitation: Students must be able to hike cross-country/narrow trails and camp (tents, sleeping bags, cooking, limited showers)  
Recommended Preparation: Introductory college-level biology courses and Wr. 1  
This field course introduces students to the flora and fauna of selected natural sites that have been the focus of influential natural history writers over the last 200 years. The course is taught as an expedition, as students plan and implement a trek to these sites, compare the flora and fauna of today to that described in historical books and essays, and prepare their own natural history journals. Introductory lectures in natural history, biology, ecology, and community structure complement direct field experiences. The course is taught entirely in the field. It is intended for both science majors and non-majors. A required course fee must be paid at or prior to the orientation session. R-E-3 | **ENV 6: ENVIRONMENTAL AND RESOURCE ECONOMICS**  
3 Units  
3 hours lecture  
Transfers: CSU, UC  
Recommended Preparation: Wr. 1 and Math 253.  
This introductory environmental and resource economics course focuses on resource, agricultural, and environmental issues and related policy analysis. The course applies microeconomic principles, models and analytical tools to problems of natural resource use and environmental quality caused by human populations. Students examine and evaluate policies to remedy the market failure of inefficient resource use, environmental degradation, and pollution, both nationally and internationally. Environmental Studies 6 is also listed as Economics 6; credit will be given in one area, not both. NR |