BIOLOGICAL SCIENCE

The biology department offers courses in a variety of interconnected topics, including microbiology, molecular biology, cellular biology, genetics, anatomy, physiology, and ecology. Many of the topics address important social problems including public health, natural resource management, nutrition and the law.

Students and faculty collaborate on laboratory research, fieldwork, and publications with real-world application. The department provides students with a broad exposure to biological processes and systems and a deep understanding of biology at environmental, organismal, cellular, and molecular levels. Through these experiences our students will gain a conceptual and experiential understanding of the biological sciences spanning from molecules to ecosystems.

Career Opportunities

Environmental Analyst, Healthcare, Life Science Education, Forensic Science, Biological Research. May require advanced degree.

Faculty

Gibbs, David

Gibbs, Jessica

Harvey, Lisa

Howard, Kristy

Jalota, Naveen

Kaiser, Hinrich

Meyer, Archie

Sauer, Frank

Transfer

- California State University, San Bernardino: Biology major
- University of California, Riverside: Biology major

For the most up-to-date information on these programs and others, visit assist.org (http://www.assist.org). Please stop by the Transfer Center in Building 23 or make an appointment with a counselor if you have questions.

Programs of Study

- Biology, AS-T (https://catalog.vvc.edu/degrees-certificates/biological-science/biology-ast/)
- Forensic Science, Biology Concentration Certificate of Achievement (https://catalog.vvc.edu/degrees-certificates/biological-science/forensic-science-biology-concentration-ca/)

Program Learning Outcomes

Program Learning Outcomes (PLOs) are statements of the kind of learning a program hopes a student will achieve. The PLOs describe the knowledge, skills, problem-solving, communication and values that apply to all certificates and/or degrees within that program.

Upon completion of this program, students should be able to:

a. Use the scientific process to formulate questions, design experiments to test hypotheses, interpret experimental results to draw conclusions, communicate results both orally and in writing, and critically evaluate the use of the scientific method from published sources.
b. Apply evolutionary theory at the molecular, cellular, organismal and population levels to explain the unity and diversity of living things.

Biological Science Courses

BIOL 98A Research Experience in International½natural History (3-4 Units)
This study abroad course offers students the opportunity to travel, and to learn about and experience first-hand biological research. The experience is designed to extend beyond the natural environment and the local geography by including the history and the culture of the trip destination(s). Pre-trip preparation may include lectures as well as reading and/or writing assignments. Participation in the travel portion of the course is mandatory. No prerequisite, permission from the instructor is required for registration. Trips vary in length from 9-13 days. Grade option.
Lecture Hours: 18.0; Lab Hours: 162.0
Transfer: Not transferable

BIOL 98B Reserch Concepts in International½natural History (4.0 Units)
This study abroad course offers students the opportunity to travel, and to learn about and conceptualize biological research first-hand. The experience is designed to extend beyond the natural environment and the local geography by including the history and the culture of the trip destination(s). Pre-trip preparation may include lectures as well as reading and/or writing assignments. Participation in the travel portion of the course is mandatory. No prerequisite, permission from the instructor is required for registration. Trips vary in length from 14-18 days. Grade option.
Lecture Hours: 18.0; Lab Hours: 162.0
Transfer: Not transferable

BIOL 98C Research in International Natural½history (5.0 Units)
This study abroad course offers students the opportunity to travel, and to learn about and conduct first-hand biological research. The experience is designed to extend beyond the natural environment and the local geography by including the history and the culture of the trip destination(s). Pre-trip preparation may include lectures as well as reading and/or writing assignments. Participation in the travel portion of the course is mandatory. No prerequisite, permission from the instructor is required for registration. Trips vary in length from 19-25 days. Grade option.
Lecture Hours: 18.0; Lab Hours: 216.0
Transfer: Not transferable

BIOL 100 General Biology (4.0 Units)
This is an introductory course with emphasis on the scientific method, analysis of scientific data, metric system, current biological problems, cellular biology, genetics and heredity, classification and systematics, evolution, ecology, behavior, and environmental issues. The laboratory will include a survey of the morphological characteristics of various organisms on this planet. (UC credit limitation).
Lecture Hours: 54.0; Lab Hours: 54.0
Transfer: Transfers to both UC/CSU

BIOL 107 Introduction to Human Biology (4.0 Units)
This course is an introduction to biology, with an emphasis on human beings. The principles and concepts of biology are covered, including the scientific method, cells, genetics, evolution, ecologyand basic anatomy and physiology of humans.
Lecture Hours: 54.0; Lab Hours: 54.0
Transfer: Transfers to CSU only

BIOL 110 Introduction to Human Nutrition (3.0 Units)
Introduction to the medical aspects of nutrition, intended for students pursuing a career in health care. Biological function and chemical classification of nutrients. Nutritional needs throughout the lifespan. Effects of nutritional deficiencies and excesses. Recommended nutrient intakes and the role of diet in the development of chronic disease.
Lecture Hours: 54.0; Lecture Hours: 3.38
Transfer: Transfers to both UC/CSU

BIOL 118 Principles of Heredity (4.0 Units)
A survey of Mendelian inheritance, quantitative traits, and population genetics. Also includes sections on DNA technology, immune genetics, and genetics of cancer. This course places special emphasis on human inheritance and family pedigree analysis, and will stress development of critical thinking and problem-solving skills.
Lecture Hours: 54.0; Lab Hours: 54.0
Transfer: Transfers to both UC/CSU

BIOL 145 Forensic Pathology (3.0 Units)
This course examines the evolution of the present-day forensic pathologist and the role(s) he/she plays in implementing the statutes mandated by law. Discussions include the physical changes occurring to the body upon and after death and how these changes impact determination of the cause, manner and mechanism of death. The scientific techniques used in forensic pathology investigations of regional injuries and death are examined, including firearms, blunt force trauma, sharp force trauma, child abuse, sexual assaults, infanticide, asphyxial and drug deaths. Law enforcement investigation, autopsy and after-death body care are explored. .
Lecture Hours: 54.0; Lecture Hours: 3.38
Transfer: Transfers to CSU only

BIOL 146 Principles of Forensic Biology (4.0 Units)
In this course students will study biological and earth science by engaging in investigations of how scientific evidence is used to solve crimes. Students take on the roles of public safety professionals to identify, collect, preserve, test, and analyze physical evidence. Each unit of this course asks how biological evidence can be used to solve a type of crime, and students explain and explore the scientific principles at work. Students learn not only how and why evidence can be used to solve crime, but also how biological processes affect the preservation and viability of physical evidence. Throughout this course, students will collect and analyze evidence from simulated crime scenes. The course culminates with students using evidence to solve a simulated homicide and delivering expert testimony in a simulated murder trial.
Lecture Hours: 54.0; Lab Hours: 54.0
Transfer: Transfers to CSU only

BIOL 149 Independent Study (1-4 Units)
Assigned projects involving research, laboratory work, or directed study for selected students who are interested in furthering their knowledge of anatomy and physiology on an independent study basis. For each unit earned, students are required to devote three hours per week throughout the semester. Enrollment limited to those who meet independent study criteria. Prior to registration, a contract must be prepared. See instructor for details.
Transfer: Transfers to CSU only

BIOL 190 Environmental Science (3.0 Units)
A study of humans in relation to the environment, that emphasizes population ecology, nutrient cycles and energy flow, pollution, food production and conservation of natural resources.
Lecture Hours: 54.0
Transfer: Transfers to CSU only

BIOL 200 Botany: Plant Diversity and Ecology (4.0 Units)
This course is intended for majors and covers comparative diversity, structure, and function of plant, fungal, and protistan phyla. Topics include development, morphology and physiology, taxonomy and systematics. Principles of population and community ecology and ecosystem interactions are emphasized. C-ID: BIOL 155.
Prerequisite(s): MATH 105, MATH 105H, MATH 120, MATH 120H, or MATH 120S, Minimum grade C
Recommended Preparation: BIOL 201 and ENGL 101.0
Lecture Hours: 54.0; Lab Hours: 54.0
Transfer: Transfers to CSU only

BIOL 201 Biology of Cells (5.0 Units)
This rigorous course will provide students with a comprehensive introduction to biological principles at the cellular and molecular level. Emphasis will be placed on the scientific method, molecular biology, biochemistry, structure and function of cells, cellular reproduction and Mendelian and molecular genetics. This course is designed for pre-professional and biology majors, but is open to all students. C-ID: BIOL 190.
Prerequisite(s): MATH 105 or higher Minimum grade C
Co-requisite(s): CHEM 201, Minimum grade C
Lecture Hours: 54.0; Lab Hours: 108.0
Transfer: Transfers to both UC/CSU

BIOL 202 Biology of Organisms (5.0 Units)
This course provides students with a comprehensive introduction to the diversity of biological organisms. Emphasis is placed on the origin of life, evolutionary relationships among groups of organisms and the basic anatomy and physiology of the major groups of living organisms and an introduction to the principles of ecology. Biology majors should also take Biology 201. C-ID: BIOL 150.
Prerequisite(s): MATH 90 or Higher, Minimum grade C
Lecture Hours: 54.0; Lab Hours: 108.0
Transfer: Transfers to both UC/CSU

BIOL 203 Population and Environmental Biology (4.0 Units)
Prerequisite: MATH 90 or above. This rigorous course is an introduction to the structure and organization of populations, communities, and ecosystems. Emphasis will be on population genetics and evolution, demography, population growth, life history traits, extinction, species interactions and behaviors, ecosystem dynamics, and evolutionary ecology, as well as selected current environmental issues. Mathematical modeling, a difficult yet important aspect of population and community ecology, will also be addressed. Students will participate in field laboratories, use statistics to analyze data, and compose scientific papers. This course is designed for biological science majors but is open to all students.
Prerequisite(s): MATH 90, Minimum grade C
Lecture Hours: 54.0; Lab Hours: 54.0
Transfer: Transfers to both UC/CSU

BIOL 211 Human Anatomy (5.0 Units)
An introduction to the gross and microscopic anatomy of the human body. Lab includes dissection of a cat, sheep eye, kidney, heart, and larynx with demonstrations on anatomical models and including demonstration on human cadavers when available. Lecture covers cells, tissues, organs, and the major human systems such as the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, respiratory, urinary, and reproductive. C-ID: BIOL 110 B.
Prerequisite(s): BIOL 107 or BIOL 201, Minimum grade C
Lecture Hours: 54.0; Lab Hours: 108.0
Transfer: Transfers to both UC/CSU

BIOL 215 Human Gross Anatomy (4.0 Units)
An advanced anatomy class that utilizes a regional approach to the study of the thorax, abdomen, and pelvis. Lecture will include medical/clinical applications and case studies on these regions. Laboratory includes hands on group dissection of these regions on a whole cadaver; as well as work on high level anatomy software. UC/ Transferable Prerequisite: Biol 211
Prerequisite(s): BIOL 211, Minimum grade C
Lecture Hours: 54.0; Lab Hours: 54.0
Transfer: Transfers to CSU only

BIOL 221 General Microbiology (5.0 Units)
Introductiontomicrobiologywithemphasison: morphology,reproduction, growth, metabolishm, genetics and taxonomy of micro organisms; methods of biotechnology applicable to microbiology; and the role of micro organisms in infectious disease, methods of control of the disease, and the immune response of the host.
Prerequisite(s): (BIOL 100, BIOL 107, or BIOL 201) and (CHEM 100 or CHEM 201, Minimum grade C)
Lecture Hours: 54.0; Lab Hours: 108.0
Transfer: Transfers to both UC/CSU

BIOL 231 Human Physiology (5.0 Units)
Study of the physiological principles, function, integration and homeostasis of the human body at the cellular, tissue, organ, organ system and organism level: integumentary system, bone, skeletal, smooth and cardiac muscles, nervous system, sensory organs, cardiovascular system, lymphatic and immune systems, respiratory system, urinary system, digestive system, endocrine system, and reproductive system. This course is primarily intended for Nursing, Allied Health, Kinesiology, and other health related majors. C-ID: BIOL 120 B.
Prerequisite(s): (BIOL 100, BIOL 107 or BIOL 201) and (BIOL 211) and (CHEM 100 or CHEM 201, Minimum Grade C)
Lecture Hours: 54.0; Lab Hours: 108.0
Transfer: Transfers to both UC/CSU

BIOL 233 Pathophysiology (3.0 Units)
This introductory pathophysiology course uses a conceptual approach to introduce pathological mechanisms of altered human states of physiology. Topics include etiology, cellular metabolism, tissue perfusion, tissue alterations, functional changes and age-related differences when applicable. Specific disease processes are discussed to demonstrate application of the mechanisms.
Lecture Hours: 54.0
Transfer: Transfers to CSU only

BIOL 295AH Biological Research I (3.0 Units)
Students who would like to explore biological research for the first time will experience basic research techniques using the scientific method. During this course, the essential elements of research will be stressed, such as literature review, writing a research proposal and conducting an experiment. Undergraduate research helps students develop valuable skills, and provides an opportunity to apply scientific knowledge in the context of real world problems.
Prerequisite(s): BIOL 100, BIOL 107, or BIOL 201; and CHEM 100 or CHEM 201, Minimum grade C
Recommended Preparation: MATH 90 or higher
Lecture Hours: 54.0; Lecture Hours: 3.38
Transfer: Transfers to CSU only

BIOL 295BH Biological Research II - Experimental½design (4.0 Units)
Students who would like to further explore biological research will use various research techniques following the scientific method. During this course, many essential elements of research will be stressed, such as literature review, writing a research proposal and conducting an experiment. Undergraduate research helps students develop valuable skills, and provides an opportunity to apply scientific knowledge in the context of real world problems.
Prerequisite(s): BIOL 100, BIOL 107, or BIOL 201, Minimum grade C
Lecture Hours: 54.0; Lab Hours: 54.0
Transfer: Transfers to both UC/CSU

BIOL 295CH Biological Research III - Research½design & Analysis (4.0 Units)
Construction of basic experimental designs based upon literature and data analyses. Students develop and participate in experimental designs of selected research projects including measurements, statistical analyses, and interpretation of data. Special emphasis will be placed on the development of laboratory skills.
Prerequisite(s): BIOL 100, BIOL 107, or BIOL 201, Minimum grade C
Recommended Preparation: MATH 90 or higher
Lecture Hours: 54.0; Lab Hours: 54.0
Transfer: Transfers to CSU only