

Definition

Biology is the study of life. Biological and Environmental Sciences covers all aspects of the study of life and emphasizes both the unity and diversity of living things. Special emphasis is placed on the relationship between structure and function, progressing through molecular, cellular, organismic and ecological levels of complexity. Evolutionary relationships are explained and illustrated.

Branches of biology such as anatomy, physiology, microbiology, zoology, botany, and ecology are concerned with the application of biological principles to human affairs.

Staff

To access faculty and staff, dial (661) 722-6300, then the 4-digit extension.

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Oswaldo Larios-Perez	2487
Barbara Leonard	2290
Jedidiah Lobos	2087
Patricia Medina	2490
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Dr. Patricia Palavecino	2515
Joshua Shipp	2300
Judy Sullivan	2278

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Program Description

Various courses within the biology program satisfy general education requirements, transfer level requirements and nursing/health occupations requirements. The program also meets the needs of students interested in improving their knowledge in biologically related fields such as agriculture and athletics. The biological sciences program includes: anatomy, biology, microbiology, and physiology.

Students must receive a minimum grade of “C” or better in all required core courses and the specific courses listed as program electives in order to qualify for the degree or certificate.

Distinctive Features

The biology and environmental sciences discipline stresses both theoretical and applied aspects of the life sciences. Extracurricular projects and field trips are regular features of some courses. Well-equipped labs are used to provide excellent training in practical biological techniques.

Career Options

Agricultural Biologist
 Bacteriologist
 Biologist
 Biotechnologist
 Botanist
 Clinical Lab Technologist
 Curator
 Dental Hygienist
 Dentist
 Ecologist
 Environmental Scientist
 Fish/Game Warden
 Food/Drug Inspector
 Geneticist
 Horticulturist
 Industrial Hygienist
 Marine Biologist
 Medical Technologist
 Parasitologist
 Physician
 Physician’s Assistant
 Pharmaceutical Sales
 Physical Therapist
 Physiologist
 Public Health Technician
 Registered Nurse
 Teacher
 Veterinarian
 Wildlife Biologist
 Zoologist
 (Most of these careers require education beyond the two-year college level.)

Program Learning Outcomes

1. Demonstrate a practical working knowledge of the scientific method, and the ability to collect, evaluate, and analyze scientific data.
2. Demonstrate an understanding of the cell structure, function, and chemistry at the molecular, cellular, tissue, and organismal levels.
3. Develop an understanding of the interactive role of living organisms in ecosystems and the environment.
4. Examine and evaluate the role of evolution and natural selection at the cellular and organismal levels.
5. Demonstrate the ability to use laboratory equipment and methods safely and proficiently as an individual or as a group.

Certificate Program

Certificate not applicable.

Associate Degree

An associate in science degree with a major in Biological Sciences is available. In addition to the GE requirements, the student should complete 18 units of required biology course work, and sufficient elective credits to total 60 units. Students who intend to transfer are strongly encouraged to complete either the Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education – Breadth (CSU GE) requirements. (See Graduation/Associate Degree Requirements and Transfer Information.)

Required Courses (10 units):	units
BIOL 110, General Molecular Cell Biology	5
BIOL 120, General Organismal, Ecological and Evolutionary Biology	5
Elective	8
Total	18

Program Electives (8 or more units):	units
BIOL 201, General Human Anatomy	4
BIOL 202, General Human Physiology	4
BIOL 204, General Microbiology	5
CHEM 110, 120, General Chemistry	10

Specific areas of study, e.g., Environmental Science, Anatomy, Physiology, Microbiology, etc. should be arranged with the assistance of the biology faculty. The faculty suggests that appropriate courses in chemistry, physics, and mathematics be taken concurrently with the biology courses.

Suggested Courses:	units
MATH 140, Precalculus	5
PHYS 101, 102, Introductory Physics	8

Completion of this degree is only a partial fulfillment of the requirements for transfer as a Biology major to an institution granting a baccalaureate degree. (See Graduation/Associate Degree Requirements.)

Transfer

Students planning to continue studies at a four-year college or university after AVC should visit the Transfer Resource Center and consult with a counselor as soon as possible. Additional information on official transfer articulation agreements from AVC to many CSU/UC campuses can be found at the following Web site: www.assist.org

Prerequisite Completion

If a course is listed as a prerequisite for another course, that prerequisite course must be completed with a satisfactory grade in order to enroll in the next course. According to Title 5, Section 55200(d), a satisfactory grade is a grade of “A,” “B,” “C” or “P”. Classes in which the Pass/No Pass option is available are indicated with an asterisk (*) before the course title. See “Pass/No Pass Option” in the catalog for full explanation.

Biological Sciences Courses

BIOL 100 ELEMENTARY HUMAN ANATOMY AND PHYSIOLOGY

3 units

5 hours weekly

(2 hours lecture, 3 hours lab)

Advisory: Eligibility for ENGL 099, READ 099 and MATH 070.

This course covers the basic structure and function of the human body. Knowledge obtained may be used by students entering either an allied health science or non-transfer level field. (AVC)

BIOL 101 GENERAL BIOLOGY

3 units

3 hours weekly

Corequisite: Concurrent enrollment in BIOL 101L.

Advisory: Eligibility for College Level Reading and ENGL 101/ENGL 101SL.

A general education non-major biology course designed to acquaint the students with the nature of science, the unity of life processes, the diversity of living things, the interdependence of organisms in the biosphere. the mechanisms that have shaped life on Earth, and with humans as biological entities. This course has a corequisite and must be taken concurrently with BIOL 101L. **NOTE:** Biology majors should take BIOL 110 and BIOL 120 instead of this course. (CSU, AVC)

BIOL 101L GENERAL BIOLOGY LAB

1 units

3 hours weekly

Corequisite: Concurrent enrollment in BIOL 101.

Advisory: Eligibility for College Level Reading and ENGL 101/ENGL 101SL.

A general education non-major laboratory biology course designed to be corequisite and taken concurrently with BIOL 101 to acquaint the students with the nature of science, the

unity of life processes, the diversity of living things, the interdependence of organisms in the biosphere. the mechanisms that have shaped life on Earth, and with humans as biological entities. The laboratory focuses on the kinds of living things, and the structures and functions they share. **NOTE:** Biology majors should take BIOL 110 and BIOL 120 instead of this course. (CSU, AVC)

BIOL 102 *HUMAN BIOLOGY

4 units

6 hours weekly

(3 hours lecture, 3 hours lab)

Advisory: Eligibility for College Level Reading, ENGL 101/ENGL 101SL and MATH 070.

This course explores the principles of biology using the human species as its primary tool. It is an introductory level, transfer course designed for non-science majors, students who want to further their professional development, or to enrich their knowledge of biology in general and their bodies in particular. Topics discussed include the scientific method, cell biology, genetics, evolution, aging, major concepts of structure, function and pathology of most organ systems, as well as how humans interact with their internal and external environment. (CSU, UC, AVC)

BIOL 103 INTRODUCTION TO BOTANY

4 units

6 hours weekly

(3 hours lecture, 3 hours lab)

Advisory: Eligibility for ENGL 099, READ 099 and MATH 070.

This is an introduction course in the study of plants. This course deals with the structure of plants, how plants grow and function and types of plants. Plant ecology and geography will also be discussed. (CSU, UC, AVC)

BIOL 104 ENVIRONMENTAL BIOLOGY

3 units

3 hours weekly

Advisory: Eligibility for ENGL 101/ENGL 101SL and MATH 070.

A general education biology course dealing with current environmental issues. Topics include environmental sustainability, ecological principles, human population impact, energy, climate change, species extinction, pollution and toxic wastes. (CSU, UC, AVC)

BIOL 110 GENERAL MOLECULAR CELL BIOLOGY

5 units

7 hours weekly

(4 hours lecture, 3 hours lab)

Prerequisite: Completion of MATH 102 and CHEM 110.

Advisory: Completion of a general biology course is recommended, and Eligibility for College Level Reading and ENGL 101/ENGL 101SL.

A comprehensive and in-depth introduction for all biology

majors (as well as physics, chemistry, engineering, computer science, and math majors who will concern themselves with biology) to the unifying principles of modern cellular biology, molecular biology and biochemistry. Topics include the structure of the atom, quantum mechanics, the nature of the chemical bond, general principles of thermodynamics and equilibrium, prokaryotic and eukaryotic cell structure, lipid chemistry and membrane biology, protein structure and function, photosynthesis and cellular respiration, nucleic acids (DNA and RNA) and their role in protein synthesis, principles of classical and molecular genetics, the control of gene expression, cell signalling systems, molecular embryology, evolutionary developmental biology, and biotechnology. Lab work includes investigations with live bacteria, protists, flowering plants and fruit flies as model organisms, and includes experiments in photosynthesis, enzymology, gel electrophoresis, genetics and biotechnology. This course stresses evolutionary mechanisms. (CSU, UC, AVC)

BIOL 120 GENERAL ORGANISMAL, ECOLOGICAL AND EVOLUTIONARY BIOLOGY

5 units

7 hours weekly

(4 hours lecture, 3 hours lab)

Prerequisite: Completion of MATH 102.

Advisory: Completion of a general biology course and/or BIOL 110, and Eligibility for College Level Reading and ENGL 101/ENGL 101SL.

A comprehensive, in-depth course designed for biology majors to complement the cell molecular perspective presented in BIOL 110. A survey of unicellular and multicellular organisms, emphasizing morphology, systematics, evolution, physiology, heredity, development, behavior and ecology. Laboratories consist of dissection and analysis of representative taxa and student projects. Data analysis and preparation of scientific reports are taught and applied to individual research projects. (CSU, UC, AVC)

BIOL 201 GENERAL HUMAN ANATOMY

4 units

8 hours weekly

(2 hours lecture, 6 hours lab)

Prerequisite: Completion of BIOL 100 or 101 or 102 or 110 or 120.

Advisory: Eligibility for College Level Reading and MATH 070.

Introduction to the structure and function of the human body. Included are lectures and demonstrations using models, isolated specimens and multimedia images of human anatomy. Laboratory study includes demonstrations and dissections of a cat and other animal and human material, including the cadaver. Completion of this class requires full participation and use of all lab materials. **NOTE:** This course is taken by students who wish to enter the Associate Degree Nursing Program, students who plan to combine their education in various healthcare fields, and

students who plan to transfer to four-year institutions to major in biology. (CSU, UC, AVC)

BIOL 202 GENERAL HUMAN PHYSIOLOGY

4 units

6 hours weekly

(3 hours lecture, 3 hours lab)

Prerequisite: Completion of BIOL 201 and CHEM 101.

Advisory: Eligibility for College Level Reading, ENGL 101/ENGL 101SL and MATH 070.

An analysis of basic processes of the human body, emphasizing the coordinated physical and chemical mechanisms of cell biology, neuromuscular, cardiovascular, respiratory, digestive, skeletal, integumentary, immune, renal, endocrine and reproductive systems. Includes work with computerized instrumentation and living animals. Completion of this course requires full participation and use of all laboratory materials.

NOTE: This course is necessary for students entering many healthcare professions including the Associate Degree Nursing Program. It is also applicable for transfer students in the biological sciences. (CSU, UC, AVC)

BIOL 204 GENERAL MICROBIOLOGY

5 units

9 hours weekly

(3 hours lecture, 6 hours lab)

Prerequisite: Completion of BIOL 101 or 110 or 120, and CHEM 101.

Advisory: Completion of BIOL 201, BIOL 202, CHEM 102, COMM 103 and ENGL 101/ENGL 101SL.

This course is designed to present an overview of the biology of microorganisms including bacteria, viruses, protozoa, fungi and helminths. Information is directed towards students in preprofessional programs for nursing, dental hygiene, surgical technology, physicians assistant, food science, environmental monitoring, animal and crop sciences as well as biological science majors. Wherever possible, new development in Biotechnology, Virology and Immunology are discussed to provide students with current knowledge in this important field of science. The laboratory introduces a broad spectrum of microorganisms and the concepts and techniques required to identify and classify unknown bacteria. (CSU, UC, AVC)

BIOL 205 *INTRODUCTION TO BIOTECHNOLOGY

3 units

5 hours weekly

(2 hours lecture, 3 hours lab)

Prerequisite: Completion of BIOL 110 or higher, and CHEM 101 or higher.

Advisory: Completion of BIOL 204, and Eligibility for College Level Reading and ENGL 101/ENGL 101SL.

The course will introduce the student to theoretical and applied concepts of Biotechnology- the use of living organisms or their products to enhance our lives and our environment. The content will cover the concepts of DNA structure, gene expression and protein synthesis. The laboratory techniques used in the Biotechnology industry will be learned and practiced by the students, including keeping a detailed lab notebook, learning and using calculations for solution preparation, preparing and analyzing DNA and protein samples by enzyme digest and gel electrophoresis, amplifying DNA by Polymerase Chain Reaction, and isolation of protein and DNA with separation techniques. Applications of these techniques in the Agricultural, Medical, Pharmaceutical and Forensic fields will be discussed. (CSU, AVC)