

BIOLOGY

Natural and Applied Sciences Division

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<http://www.cabrillo.edu/programs>

Information for Biology Majors

(Biology, Agriculture, Physiology, Microbiology, Botany, Entomology, Zoology, Ecology, Environmental Studies, Oceanography, Nursing, Dental Hygiene, Physical Therapy, Public Health, Medical Technology, etc.)

Biology is the study of living organisms. Through the use of the scientific method, biologists seek to understand the unity and diversity of life. By understanding biological processes, we can make intelligent decisions regarding our environment, our health and our place in the ecosystem.

A solid background in the life sciences is required for many careers, including work in the allied health professions, agriculture, food service, parks and recreation, and education. Occupations with a scientific and technological component will be increasingly available in the future.

High School Preparation: Chemistry, physics, and four years of college preparatory mathematics; a foreign language is recommended.

A biology major transfers to a four-year institution to complete a bachelor's degree. Cabrillo's Biology program is articulated with the UC and CSU systems and includes the standard courses needed to complete the first two years of the major.

Verification of prerequisites will be required. Prerequisites for courses in this department are computer enforced. Students should be sure records have been entered into the Cabrillo computer system before attempting to enroll.

MODEL PROGRAM FOR BIOLOGY

The following model program fulfills requirements for the A.S./A.A. Degree in Biology at Cabrillo College. Specific lower division major preparation at four-year public institutions in California can be found at www.assist.org. Please see a counselor for advisement for transfer to any four-year institution.

Biology Core	Units
BIO 1ABC	General: Molecular, Animal, Plant 15

Related Disciplines

CHEM 1AB	General Chemistry 10
CHEM 12A & AL/12B & BL	Organic Chemistry. 5-10
Foreign Language* 0-12
MATH 5ABC	Analytic Geometry and Calculus I, II, III. 12
PHYS 2AB	General Physics
OR	
PHYS 4ABC	Physics for Scientists and Engineers 8-15

*The student should consult the catalog of the intended transfer institution concerning the necessity or appropriateness of these courses.

Associate in Science Degree in Biology

General Education	21
Biology Core.	15

From Related Disciplines	24
Total for A.S. Degree in Biology	60

Associate in Arts Degree in Biology

General Education	30
Biology Core.	15
From Related Disciplines	15
Total for A.A. Degree in Biology	60

Biology Courses

BIO 1A

Cell and Molecular Biology

5 units; 3 hours Lecture, 6 hours Laboratory

Prerequisite: CHEM 1A.

Corequisite: Completion of or concurrent enrollment in BIO 201.

Recommended Preparation: ENGL 100 and READ 100.

Examines in-depth the molecular mechanisms of cell function. Students learn how molecules interact to give cells the ability to use energy, reproduce, grow, and develop. Topics include cell structure and function, cell signaling, DNA structure and function, cell division, genetics, biotechnology, gene expression, development, and human diseases. Introduces students to interpreting and critiquing primary research articles. Laboratories focus on the use of biotechnologies in solving research questions and diseases.

Transfer Credit: Transfers to CSU; UC. CAN BIOL2.

BIO 1B

Animal Diversity and Evolutionary Principles

5 units; 3 hours Lecture, 6 hours Laboratory

Prerequisite: MATH 152.

Corequisite: Completion of or concurrent enrollment in BIO 201.

Recommended Preparation: ENGL 100 and READ 100.

Introduces principles of evolutionary biology, and examines their application in a survey of important animal clades. The course also explores in-depth diversity in animal form and function, and considers how evolutionary history, selection, and other factors produce different solutions to problems that many animals have in common. Labs introduce students to techniques used to study evolutionary problems, and give them experience with a diversity of animal groups.

Transfer Credit: Transfers to CSU; UC. CAN BIOL4.

BIO 1C

Plant Biology and Ecological Principles

5 units; 3 hours Lecture, 6 hours Laboratory

Prerequisite: MATH 152.

Corequisite: Completion of or concurrent enrollment in BIO 201.

Recommended Preparation: ENGL 100 and READ 100.

Presents an in-depth exploration of diversity in plant form and function, and introduces students to principles of ecology. Students learn how evolutionary history, selection, ecology, and other factors produce different solutions to problems that many plants have in common. The lectures provide the informational and thematic framework for the course. The laboratories introduce students to the diversity of plant groups, and teach techniques used to study ecological problems.

Transfer Credit: Transfers to CSU; UC. CAN BIOL6.

BIO 4

Human Anatomy

4 units; 3 hours Lecture, 3 hours Laboratory

Corequisite: Completion of or concurrent enrollment in BIO 201.

Recommended Preparation: ENGL 100, READ 100, MA 170A, and MA 170B.

The gross structure of the organ systems of the human body are covered through lecture, demonstrations, and dissection. This course is planned for allied health students. Portions of the course may be offered in a Distance-Learning Format.

Transfer Credit: Transfers to CSU; UC, with limits: BIO 4 combined with BIO 5 and 13A + 13AL- maximum credit: 2 courses CAN BIOL10.

BIO 4A

Human Anatomy Coordinated Studies

1 unit; 3 hours Directed Study

Corequisite: BIO 4.

Recommended Preparation: Eligibility for ENGL 100 and READ 100.

Enrichment program in anatomy, to be taken concurrently with BIO 4. Course is tailored to individual need and interest as enrichment or an expansion of subject area material through laboratory or directed reading.

Transfer Credit: Transfers to CSU.

BIO 5

Human Physiology

4 units; 3 hours Lecture, 3 hours Laboratory

Prerequisite: CHEM 2 taken at college or CHEM 30A or CHEM 32.

Recommended Preparation: BIO 4, ENGL 100, and READ 100.

Presents an exploration of the functions of the various anatomical systems and their underlying chemical basis. Functions of cells, tissues, organs and systems are examined with respect to the human organism through lecture and laboratory. Designed to fill the needs of allied health students. Portions of the course may be offered in a Distance-Learning Format.

Transfer Credit: Transfers to CSU; UC, with limits: BIO 5 combined with BIO 4 and 13A + 13AL- maximum credit-2 courses CAN BIOL12.

BIO 6

Microbiology

4 units; 3 hours Lecture, 3 hours Laboratory

Prerequisite: CHEM 2 taken at college or CHEM 30A or CHEM 32.

Corequisite: BIO 201.

Recommended Preparation: ENGL 100 and READ 100.

Presents a survey of microbiology covering cell structure, metabolism, molecular genetics, growth and control of microorganisms, and their role in infectious disease. Emphasis is on bacterial organisms, but includes eukaryotic microbes and viruses as well.

Transfer Credit: Transfers to CSU; UC. CAN BIOL14.

BIO 7

Head and Neck Anatomy and Embryology

2 units; 1.5 hours Lecture, 1.5 hours Laboratory

Prerequisite: BIO 4 and ENGL 100.

Recommended Preparation: READ 100.

Covers the skeletal, muscular, vascular and neuroanatomy of the head and neck, emphasizing aspects useful for dental hygiene students. Embryonic development of the head, neck and oral cavity with emphasis on the microscopic anatomy of the mandible, maxilla and associated structures. Portions of the course will be taught in a Distance-Learning Format.

Transfer Credit: Transfers to CSU.

BIO 10

Plants and Civilization

3 units; 3 hours Lecture

Corequisite: BIO 1C.

Recommended Preparation: Eligibility for ENGL 100 and MATH 154.

A course dealing with the historical aspects of man's cultivation and utilization of plants with emphasis on the ways in which plants have influenced human, social, cultural and economic development.

Transfer Credit: Transfers to CSU, UC.

BIO 11A

General Biology

4 units; 3 hours Lecture and 3 hours Laboratory

Corequisite: Completion of concurrent enrollment in BIO 201.

Recommended Preparation: Eligibility for ENGL 100 and READ 100.

Presents an introduction to the world of living things. Topics include molecular and cell biology, genetics, biotechnology, human biology, diversity of life, evolution, and ecology. Emphasis is on current biological issues. Recommended for non-biology majors or prospective biology majors who lack previous high school biology course work.

Transfer Credit: Transfers to CSU. Transfers to UC with conditions: No credit if take after BIO 1A, 1B, or 1C.

BIO 11B

Marine Biology

4 units; 3 hours Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 and READ 100.

Explore the local ocean habitats and marine organisms of the Monterey Bay National Marine Sanctuary. Emphasis will be on ecological relationships, adaptations of organisms to their environments, and marine conservation efforts. Several field trips will take place during the lab sessions.

Transfer Credit: Transfers to CSU, UC.

BIO 11C

Ecology

5 units; 3 hours Lecture, 6 hours Laboratory

Recommended Preparation: MATH 154; ENGL 100 and READ 100.

Covers the principles of ecology for Biology and Environmental Studies majors, covering factors influencing distribution, abundance and evolution of organisms. Includes simulations, experiments, individual projects and field trips.

Transfer Credit: Transfers to CSU, UC.

BIO 13A

Biology of People-Anatomy and Physiology

3 units; 3 hours Lecture

Recommended Preparation: Eligibility for ENGL 100 and READ 100.

A survey of the integration of structure (anatomy) and function (physiology) which produces the most wonderful of machines, the human body. The healthy state is emphasized but selected disease processes are covered. Intended for nonscience majors. Not open to students who have taken BIO 4 or BIO 5. Portions of this course may be offered in a Distance-Learning Format.

Transfer Credit: Transfers to CSU; UC, with limits: BIO 13A + 13AL combined with BIO 4 and 5- maximum credit- 2 courses.

BIO 13AL

Biology of People-Anatomy & Physiology Lab

1 unit; 3 hours Laboratory

Repeatability: May be taken a total of 2 times.

Corequisite: Completion of or concurrent enrollment in BIO 13A and BIO 201.

Recommended Preparation: Eligibility for ENGL 100 and READ 100.

Course is an optional laboratory course to accompany BIO 13A lecture. It involves hands-on experiences to help students understand the various structures and functions of the body. Includes use of models, experimentation, demonstrations, and limited dissection.

Transfer Credit: Transfers to CSU; UC, with limits: BIO 13A + 13AL combined with BIO 4 and 5-maximum credit-2 courses.

BIO 13B

Biology of People-Human Genetics

3 units; 3 hours Lecture

Recommended Preparation: Eligibility for ENGL 100 and READ 100.

Introduction to basic principles of inheritance and how they apply to humans. Includes Mendelian genetics, molecular genetics, medical genetics, genetics of cancer and immunity, reproductive technology, human diversity and evolution, behavioral genetics, and bioethics.

Transfer Credit: Transfers to CSU, UC.

BIO 15A

Natural History of Western America

5 units; 3 hours Lecture, 6 hours Laboratory

Repeatability: May be taken a total of 2 times.

Recommended Preparation: Eligibility for ENGL 100 and READ 100; MATH 154.

Involves extensive field experiences including biology of deserts, mountains, islands, or tropical forests. Learning will be based upon readings, lectures, group and individual research projects. Focus will be how ecological, behavioral and evolution theory is reflected in patterns seen in these communities, along with identification methods for native plants and animals. Students must be prepared for a primitive camping experience and long hours of intensive learning.

Transfer Credit: Transfers to CSU.

BIO 15AC

Natural History of Western America

7 units; 4 hours Lecture, 9 hours Laboratory

Repeatability: May be taken a total of 2 times.

Recommended Preparation: Eligibility for ENGL 100 and READ 100; MATH 154.

Involves extensive field experiences including biology of deserts, mountains, islands, or tropical forests. Learning will be based upon readings, lectures, group and individual research projects. Focus will be how ecological, behavioral and evolution theory is reflected in patterns seen in these communities, along with identification methods for native plants and animals. Students must be prepared for a primitive camping experience and long hours of intensive learning.

Transfer Credit: Transfers to CSU.

BIO 15B

Natural History of Western America

3 units; 1.5 hours Lecture, 4.5 hours Laboratory

Repeatability: May be taken a total of 2 times.

Recommended Preparation: Eligibility for ENGL 100 and READ 100; MATH 154.

Involves extensive field experiences including biology of deserts, mountains, islands, or tropical forests. Learning will be based upon readings, lectures, group and individual research projects. Focus will be how ecological, behavioral and evolution theory is reflected in patterns seen in these communities, along with identification methods for native plants and animals. Students must be prepared for a primitive camping experience and long hours of intensive learning.

Transfer Credit: Transfers to CSU.

BIO 15BCD

Natural History of Western America

6 units; 2.5 hours Lecture, 10.5 hours Laboratory

Repeatability: May be taken a total of 2 times.

Recommended Preparation: Eligibility for ENGL 100 and READ 100; MATH 154.

Involves extensive field experiences including biology of deserts, mountains, islands, or tropical forests. Learning will be based upon readings, lectures, group and individual research projects. Focus will be how ecological, behavioral and evolution theory is reflected in patterns seen in these communities, along with identification methods for native plants and animals. Students must be prepared for a primitive camping experience and long hours of intensive learning.

Transfer Credit: Transfers to CSU.

BIO 15BD

Natural History of Western America

4 units; 1.5 hours Lecture, 7.5 hours Laboratory

Repeatability: May be taken a total of 2 times.

Recommended Preparation: Eligibility for ENGL 100 and READ 100; MATH 154.

Involves extensive field experiences including biology of deserts, mountains, islands, and tropical forests. Learning will be based upon readings, lectures, group and individual research projects. Focus will be how ecological, behavioral and evolution theory is reflected in patterns seen in these communities, along with identification methods for native plants and animals. Students must be prepared for a primitive camping experience and long hours of intensive learning.

Transfer Credit: Transfers to CSU.

BIO 15C

Natural History of Western America

2 units; 1 hour Lecture, 3 hours Laboratory

Repeatability: May be taken a total of 2 times.

Recommended Preparation: Eligibility for ENGL 100 and READ 100; MATH 154.

Involves extensive field experiences including biology of deserts, mountains, islands, or tropical forests. Learning will be based upon readings, lectures, group and individual research projects. Focus will be how ecological, behavioral and evolution theory is reflected in patterns seen in these communities, along with identification methods for native plants and animals. Students must be prepared for a primitive camping experience and long hours of intensive learning.

Transfer Credit: Transfers to CSU.

BIO 15CD

Natural History of Western America

3 units; 1 hour Lecture, 6 hours Laboratory

Repeatability: May be taken a total of 2 times.

Recommended Preparation: Eligibility for ENGL 100 and READ 100; MATH 154.

Involves extensive field experiences including biology of deserts, mountains, islands, or tropical forests. Learning will be based upon readings, lectures, group and individual research projects. Focus will be how ecological, behavioral and evolution theory is reflected in patterns seen in these communities, along with identification methods for native plants and animals. Students must be prepared for a primitive camping experience and long hours of intensive learning.

Transfer Credit: Transfers to CSU.

BIO 15D

Natural History of Western America

1 unit; 3 hours Laboratory

Repeatability: May be taken a total of 2 times.

Recommended Preparation: Eligibility for ENGL 100 and READ 100; MATH 154.

Involves extensive field experiences including biology of deserts, mountains, islands, or tropical forests. Learning will be based upon readings, lectures, group and individual research projects. Focus will be how ecological, behavioral and evolution theory is reflected in patterns seen in these communities, along with identification methods for native plants and animals. Students must be prepared for a primitive camping experience and long hours of intensive learning.

Transfer Credit: Transfers to CSU.

BIO 17A-Z

Special Topics in Biology

2–3 units; 2 hour Lecture or 6 hours Laboratory

Repeatability: May be taken a total of 4 times.

Recommended Preparation: Eligibility for ENGL 100 and READ 100.

Presents special topics in biology such as recent advances in specialized fields, vertebrate biology, aquatic biology, soil organisms, and multidisciplinary approaches incorporating chemistry and physics in the effort of scientific inquiry. Course content may vary with each offering.

Transfer Credit: Transfers to CSU; UC, with conditions: Students must retain a copy of the course outline, the course syllabus and work completed for this course. Credit for this course is contingent upon a review of the course outline and other materials by the UC transfer campus.

BIO 21A

Field Biology

4 units; 3 hours Lecture, 3 hours Laboratory

Recommended Preparation: MATH 154; Eligibility for ENGL 100 and READ 100.

Introduces natural history classification, distribution, ecology, and evolution of common plants and animals, emphasizing biological field methods in the study of biotic populations.

Transfer Credit: Transfers to CSU, UC.

BIO 201

Introduction to the Microscope

0.5 unit; 0.5 hour Lecture

An introduction to optical microscopy emphasizing operation of compound and dissecting microscopes. Preparation of various biological specimens will also be considered.