BIOLOGY

BIOL V01 - PRINCIPLES OF BIOLOGY - 3 Units

Hours: 3 lecture weekly

The course provides an introduction to the basic principles of biology and covers the biochemistry, physiology, morphology, behavior, genetics, evolution, taxonomy and ecology of living things. The companion laboratory course provides hands-on activities to illustrate these principles. This course is designed for non-biology majors.

Field trips may be required. Formerly Biol 1. Transfer credit: CSU; UC; credit limitations - see counselor.

BIOL V01L - PRINCIPLES OF BIOLOGY LABORATORY - 1 Unit

Prerequisite: BIOL V01 or concurrent enrollment
Hours: 3 laboratory weekly

The course provides a hands-on introduction to the basic principles of biology and covers the biochemistry, physiology, morphology, behavior, genetics, evolution, taxonomy, and ecology of living things. This course is designed for non-biology majors.

Field trips may be required. Transfer credit: CSU; UC; credit limitations - see counselor.

BIOL V01S - BIOLOGY STUDY SESSION - 1 Unit

Corequisite: BIOL V01
Hours: 1 lecture weekly

This course will give students opportunities to discuss and ask questions about material covered in the lecture and laboratory. Review of tests will occur and methods of taking notes and studying will be considered. The course will enable students to better comprehend course material and thus improve performance in the course.

Formerly Biol 1S. Offered on a credit/no credit basis only. Not applicable for degree credit.

BIOL V03 - INTRODUCTION TO ORGANISMAL AND ENVIRONMENTAL BIOLOGY - 5 Units

Prerequisite: CHEM V01A-V01AL or CHEM V20-V20L or 1 year of high school chemistry with grades of C or better
Recommended preparation: ANPH V01 or BIOL V01-V01L or BIOL V29-V29L or MICR V01 or 1 year of high school biology with grades of C or better; CHEM V01B-V01BL; MATH V21A or V46A; and MATH V44
Hours: 3 lecture, 6 laboratory weekly

This course is an introduction to organismal diversity, structure and function. Groups to be studied and discussed include eubacteria, archaea, protists, fungi, plants and animals. The latter two groups will be studied in more detail, concentrating on structure and physiology. The overall emphasis of the course will be on the evolutionary and ecological relationships between organisms. The laboratory will develop skills of analysis and observation as they relate to the preceding topics.

Field trips will be required. Formerly BIOL V20B. Transfer credit: CSU; UC. **CAN BIOL SEQ A [with BIOL V04].**

BIOL V04 - INTRODUCTION TO CELL AND MOLECULAR BIOLOGY - 5 Units

Prerequisite: CHEM V01A-V01AL
Recommended preparation: BIOL V03; CHEM V01B-V01BL; MATH V21A or V46A; and MATH V44
Hours: 3 lecture, 6 laboratory weekly

This course is an introduction to modern cell and molecular biology. The focus will be on the structure and function relationships found within living cells and the inheritance of genetic information, both with an evolutionary emphasis. The laboratory will develop skills of analysis and observation as they relate to the preceding topics.

Field trips may be required. Formerly BIOL V20A. Transfer credit: CSU; UC. **CAN BIOL 2 OR BIOL SEQ A [with BIOL V03].**

BIOL V10 - INTRODUCTION TO ENVIRONMENTAL ISSUES - 3 Units

Hours: 3 lecture weekly

An examination and analysis of the biological sciences within the context of the interrelationship between human populations and their natural surroundings. The characteristics of natural systems are described and the effects and impacts of human activities on these systems are considered. The course introduces the principles of scientific inquiry and experimental methodology in the study of ecological concepts and environmental issues. Alternatives and approaches to deal with environmental problems are considered and evaluated.

Field trips may be required. Formerly Biol 10. Transfer credit: CSU; UC.

BIOL V12 - PRINCIPLES OF HUMAN BIOLOGY - 3 Units

Hours: 3 lecture weekly

This is an introductory course designed for the nonbiology major in the principles of biology, with special emphasis on the structure and function of the human being. It provides a study of body systems and their relationship to health or disease.

Field trips may be required. Formerly Biol 12. Transfer credit: CSU; UC; credit limitations - see counselor.

BIOL V14 - FIELD BIOLOGY - 3 Units

Hours: 2 lecture, 3 laboratory weekly

This course includes the basic concepts of ecosystems, niche, community, population dynamics, energy flow, and materials recycling, particularly as they relate to natural resources. Field trips will stress identification, classification and interrelationships of common plants and animals as they occur in biotic communities.

Field trips will be required. Formerly Biol 14. Transfer credit: CSU.

BIOL V18 - HUMAN HEREDITY - 3 Units

Recommended preparation: BIOL V01-V01L or BIOL V04
Hours: 3 lecture weekly

This course is an introduction to the basic principles of modern genetics and evolutionary theory with specific reference to the human being. Through the study of the mechanisms of human inheritance, the origin and nature of human differences will be examined. Social, political and psychological ramifications of the biological laws governing heredity and organic evolution will be emphasized.

Field trips may be required. Formerly Biol 18. Transfer credit: CSU; UC.

BIOL V20S - GENERAL BIOLOGY STUDY SESSION - 1 Unit
Corequisite: BIOL V03 or BIOL V04
Hours: 1 lecture weekly

This course will give students opportunities to discuss and ask questions about material covered in the lecture and laboratory. Methods of taking notes and studying will be considered. The course will enable students to better comprehend course material and thus improve performance in the course.

Formerly Biol 20S. Offered on a credit/no credit basis only. Not applicable for degree credit.

BIOL V29 - MARINE BIOLOGY - 3 Units
Hours: 3 lecture weekly

This course is an introduction to marine biology, with emphasis on the physiology, morphology, taxonomy, ecology, evolution and natural history of marine organisms. The conservation of the marine environment will also be considered.

Field trips may be required. Formerly Biol 29. Transfer credit: CSU; UC.

BIOL V29L - MARINE BIOLOGY LABORATORY - 1 Unit
Prerequisite: BIOL V29 or concurrent enrollment
Hours: 3 laboratory weekly

This course includes laboratory and field studies of marine organisms and environment to examine biological principles and the scientific method.

Field trips will be required. Formerly Biol 29L. Transfer credit: CSU; UC.

BIOL V29S - MARINE BIOLOGY STUDY SESSION - 1 Unit
Corequisite: BIOL V29
Hours: 1 lecture weekly

This course will give the student opportunities to discuss and ask questions about the material covered in the lecture and laboratory. Reviews of quizzes and exams will occur and methods of taking notes for the course will be considered. The course will enable the student to better comprehend the course material and thereby improve performance.

Formerly Biol 29S. Offered on a credit/no credit basis only. Not applicable for degree credit.

BIOL V30 - INTRODUCTION TO BIOTECHNOLOGY AND MOLECULAR BIOLOGY - 3 Units
Recommended preparation: BIOL V01-V01L or BIOL V04 or BIOL V12 or MICR V01 or equivalent; and CHEM V20-V20L or equivalent with grades of C or better
Hours: 3 lecture weekly

Introduction to the genetic mechanisms and methods of bioengineering as they apply to biotechnology. Emphasis is placed on molecular and biochemical methods utilized in biotechnological applications in industry, including fermentation technology, genetic transformation, isolation of bioproducts by electrophoresis, chromatography and other methods. FDA regulations that apply to the biotechnology industry will be included. Guest speakers from the biotechnology research industry may be invited to address the class.

Field trips will be required. Formerly Biol 30. Transfer credit: CSU; UC.

BIOL V31 - INTRODUCTION TO METHODS OF BIOTECHNOLOGY AND MOLECULAR BIOLOGY - 4 Units
Recommended preparation: BIOL V30 or concurrent enrollment; CHEM V20-V20L or high school chemistry with grades of C or better; and MICR V01
Hours: 2 lecture, 6 laboratory weekly

This course is designed to provide a variety of biotechnology and molecular biology experiences which develop proficiency in molecular biology techniques, and the application of specialized biotechnology equipment in problem solving. Its intent is to develop knowledge of biotechnology protocols, an awareness of laboratory safety, as well as enthusiasm and academic interests in molecular biology and biotechnology. ANSI Z87.1 approved safety glasses are required.

Field trips will be required. Formerly Biol 31. Transfer credit: CSU.

BIOL V31S - MOLECULAR BIOLOGY AND BIOTECHNOLOGY STUDY SESSION - 1 Unit
Corequisite: BIOL V31 or BIOL V32
Hours: 1 lecture weekly

This course is designed to give students additional opportunities to discuss and ask questions about the material covered in lecture and lab. The course will enable students to better comprehend course material and improve performance in the course.

Formerly Biol 31S. Offered on a credit/no credit basis only. Not applicable for degree credit.

BIOL V32 - INTRODUCTION TO METHODS OF PLANT BIOTECHNOLOGY AND MOLECULAR BIOLOGY - 2 Units
Prerequisite: BIOL V30 or concurrent enrollment; and CHEM V20-V20L or high school chemistry with grades of C or better
Recommended preparation: AG V03
Hours: 1 lecture, 3 laboratory weekly

This course is designed for plant biotechnicians and educators in plant molecular biological techniques. Proficiency will be developed in aseptic tissue culture, tissue inductions, isolation of plant cell organelles and products, and related molecular biological methods. Problems and solutions specific to plant biotechnology will be stressed. ANSI Z87.1 approved safety glasses are required.

Field trips may be required. Formerly Biol 32. Offered on a credit/no credit basis only. Transfer credit: CSU; credit limitations - see counselor.

BIOL V33 - BASIC LABORATORY TECHNICAL SKILLS - 2 Units
Hours: 1 lecture, 3 laboratory weekly

A hands-on experience with the types of activities that are basic to any chemistry or biology laboratory technical position such as: basic safety procedures, accurate determinations of mass and volume, simple solution making, buffer preparation and measurement of pH, basic data analysis, etc. This course will also prepare the student for an entry-level position either in industry or as a laboratory employee at a college or university. ANSI Z87.1 approved safety glasses required.

Field trips may be required. Offered on a credit/no credit basis only.

BIOL V34 - APPLIED MICROBIOLOGY FOR LABORATORY TECHNICIANS - 2 Units
Hours: 1 lecture, 3 laboratory weekly
Hands-on experience with the types of microbiological activities that are basic to most introductory laboratory technical assistant positions such as: basic safety procedures, aseptic transfer, autoclaving, filtration, Gram and simple staining, simple culturing methods (including the use of laminar flow hoods and incubators), microscope use and care, media preparation, environmental sampling, etc. This course will help prepare the student for an entry level position either in industry or as a laboratory employee at a college or university. This course is not designed for pre-nursing or health science majors.
Field trips may be required. Offered on a credit/no credit basis only.

BIOL V35 - BIOSCIENCE COMMUNICATION SKILLS - 3 Units
Hours: 3 lecture weekly
This course will provide training in critical reading and discussion of articles from current scientific literature with peers and faculty. The course also provides the opportunity to present and receive feedback in a helpful environment. Topics will be selected by the faculty.
Field trips may be required. Offered on a credit/no credit basis only.

BIOL V40 - BIOLOGY OF CARDIOVASCULAR DISEASES - 3 Units
Recommended preparation: ANPH V01 or PHSO V01 or high school equivalent or concurrent enrollment
Hours: 3 lecture weekly
An in-depth examination of the nature, causes, and treatment of cardiovascular diseases, stressing a comparison between normal cardiovascular physiology and pathophysiology. This is a seminar course, with participation of the health care community (based on availability). CEUs may be awarded to qualified professionals.
Field trips may be required. Transfer credit: CSU.

BIOL V41 - BIOLOGY OF CANCER - 3 Units
Recommended preparation: ANPH V01 or PHSO V01 or high school equivalent or concurrent enrollment
Hours: 3 lecture weekly
This course is an introduction to the clinical, biological, and psychosocial aspects of cancer (including the molecular, cellular and immunological mechanisms). This is an seminar course and will include speakers from the health care professions.
Field trips may be required. Transfer credit: CSU; UC.

BIOL V60A-Z - TOPICS IN BIOLOGY - .5-6 Units
Prerequisite: varies with topic
Hours: lecture and/or laboratory as required by unit formula
These courses consider topics not covered in detail by other biology offerings.
Field trips may be required. Transfer credit: determined by transfer institution.

BIOL V60A - BIOTECHNOLOGY INDUSTRY SKILLS I - 1 Unit
Recommended preparation: BIOL V18, V30, V33 and V34; CHEM V20-V20L and V21-V21L; and MATH V03
Hours: 1 lecture weekly
An exploration of the biotechnology industry, providing entry skill development. This course will include principles of biofermenter design, appropriate terminology, good documentation practices, and Good Manufacturing Practice regulations appropriate to biofermenter function. Lab coat, sterile gloves and ANZI Z81.7 safety glasses required.
Field trips may be required. Offered on a credit/no credit basis only.

BIOL V60B - BIOTECHNOLOGY INDUSTRY SKILLS II - 1 Unit
Recommended preparation: BIOL V18, V30, V33 and V34; CHEM V20-V20L and V21-V21L; and MATH V03
Hours: .5 lecture, 1.5 laboratory weekly
An exploration of the biotechnology industry, providing entry skill development. This course will include principles of economic efficiency related to biofermenter design, principles of sterilization by chemical and physical means, microbial culturing, instrument calibration and troubleshooting, and Good Manufacturing Practice regulations appropriate to microbial culture. Lab coat, sterile gloves and ANZI Z81.7 safety glasses required.
Field trips may be required. Offered on a credit/no credit basis only.

BIOL V60C - BIOTECHNOLOGY INDUSTRY SKILLS III - 1 Unit
Recommended preparation: BIOL V18, V30, V33 and V34; CHEM V20-V20L and V21-V21L; and MATH V03
Hours: .5 lecture, 1.5 laboratory weekly
An exploration of the biotechnology industry, providing entry skill development. This course will include principles of use and care of the autoclave, centrifuges, other analysis instruments and their troubleshooting, including Good Manufacturing Practice regulations appropriate to microbial culture. Lab coat, sterile gloves and ANZI Z81.7 safety glasses required.
Field trips may be required. Offered on a credit/no credit basis only.

BIOL V60D - BIOTECHNOLOGY INDUSTRY SKILLS IV - 1 Unit
Recommended preparation: BIOL V18, V30, V33 and V34; CHEM V20-V20L and V21-V21L; and MATH V03
Hours: .5 lecture, 1.5 laboratory weekly
An exploration of the biotechnology industry, providing entry skill development. This course will include principles used in choosing, calculating and preparing buffers and inoculating cell cultures using Good Manufacturing Practice regulations. Lab coat, sterile gloves and ANZI Z81.7 safety glasses required.
Field trips may be required. Offered on a credit/no credit basis only.

BIOL V60E - BIOTECHNOLOGY INDUSTRY SKILLS V - 1 Unit
Recommended preparation: BIOL V18, V30, V33 and V34; CHEM V20-V20L and V21-V21L; and MATH V03
Hours: .5 lecture, 1.5 laboratory weekly
An exploration of the biotechnology industry, providing entry skill development. This course will include principles for aseptic culture of cells, analysis of pH, temperature, oxygen and osmotic conditions on cell growth using the Good Manufacturing Practice regulations. Lab coat, sterile gloves and ANZI Z81.7 safety glasses required.
Field trips may be required. Offered on a credit/no credit basis only.

BIOL V60F - BIOTECHNOLOGY INDUSTRY SKILLS VI - 1 Unit
Recommended preparation: BIOL V18, V30, V33 and V34; CHEM V20-V20L and V21-V21L; and MATH V03
Hours: .5 lecture, 1.5 laboratory weekly
An exploration of the biotechnology industry, providing entry skill development. This course will include principles and techniques used in bioengineering related to protein purification methods by chromatography including analysis methods using Good Manufacturing Practice regulations. Lab coat, sterile gloves and ANZI Z81.7 safety glasses required.
Field trips may be required. Offered on a credit/no credit basis only.

BIOL V60G - BIOTECHNOLOGY INDUSTRY SKILLS VII - 1 Unit
Recommended preparation: BIOL V18, V30, V33 and V34; CHEM V20-V20L and V21-V21L; and MATH V03
Hours: .5 lecture, 1.5 laboratory weekly

An exploration of the biotechnology industry, providing entry skill development. This course will include principles and techniques used for plate and culture counts, photometric measurements and instrument calibration related to protein purification procedures and appropriate to Good Manufacturing Practice regulations. Lab coat, sterile gloves and ANZI Z81.7 safety glasses required.

Field trips may be required. Offered on a credit/no credit basis only.

BIOL V60H - BIOTECHNOLOGY INDUSTRY SKILLS VIII - 1 Unit
Recommended preparation: BIOL V18, V30, V33 and V34; CHEM V20-V20L and V21-V21L; and MATH V03
Hours: .5 lecture, 1.5 laboratory weekly

An exploration of the biotechnology industry, providing entry skill development. This course will include principles and techniques used in immune assays (ELISA) for batch and lot record certification requirements appropriate to Good Manufacturing Practice regulations. Lab coat, sterile gloves and ANZI Z81.7 safety glasses required.

Field trips may be required. Offered on a credit/no credit basis only.

BIOL V88 - BIOLOGY WORKSHOPS - .5-10 Units
Prerequisite: varies with topic
Hours: lecture and/or laboratory as required by unit formula

Designed to meet specific needs of the college and community, as required and requested by persons whose needs in this area are not met by present course offerings.

Fees may be required. Field trips may be required. Courses with same title may not be repeated; may be taken for a maximum of 4 times.

BIOL V89 - WORKSHOPS IN BIOLOGY - .5-10 Units
Prerequisite: varies with topic
Hours: lecture and/or laboratory as required by unit formula

Designed to meet specific needs of the college and community, as required and requested by persons whose needs in this area are not met by present course offerings.

Fees may be required. Field trips may be required. Courses with same title may not be repeated; may be taken for a maximum of 4 times. Formerly Biol 89. Transfer credit: CSU; for UC, determined after admission.

BIOL V90 - DIRECTED STUDIES IN BIOLOGY - 1-6 Units
Prerequisite: varies with topic
Hours: lecture and/or laboratory as required by unit formula

This course offers specialized study opportunities to students with intermediate skills who wish to pursue projects not included in the regular curriculum. Students are accepted only by written project proposal approved by the discipline prior to enrollment.

Field trips may be required. May be taken for a maximum of 4 times not to exceed 6 units. Formerly Biol 90. Transfer credit: CSU; for UC, determined after admission.

BIOL V95 - BIOLOGY INTERNSHIP I - 1-4 Units
Corequisite: enrolled in a minimum of 7 units to include internship
Recommended preparation: completion of or concurrent enrollment in one course in the discipline
Hours: 60 per unit

This biology internship offers students who are volunteers (unpaid) an opportunity to obtain work experience related to their field of study. Students are accepted as a result of consultation with a designated faculty member in the discipline and the acceptance of an approved work proposal.

Field trips will be required. May be taken for a maximum of 4 times, not to exceed 16 units total in combination with any other work experience/internship courses. Offered on a credit/no credit basis only. Transfer credit: for CSU, credit limitations - see counselor; for UC, determined after admission.

BIOL V96 - BIOLOGY INTERNSHIP II - 1-4 Units
Corequisite: enrolled in a minimum of 7 units to include internship
Recommended preparation: completion of or concurrent enrollment in one course in the discipline
Hours: 75 per unit

This biology internship offers students who are employed in the field an opportunity to expand their work experience related to their field of study. Students are accepted as a result of consultation with a designated faculty member in the discipline and the acceptance of an approved work proposal.

Field trips will be required. May be taken for a maximum of 4 times, not to exceed 16 units total in combination with any other work experience/internship courses. Offered on a credit/no credit basis only. Transfer credit: for CSU, credit limitations - see counselor; for UC, determined after admission.