

Biology (BIO) Courses

BIO1011 General Biology - Cellular

This course provides an introduction to the structure, function and genetics of living organisms. It is designed to be a first course for biology majors and to provide a foundation for more advanced courses in the biological sciences. Topics include the chemistry of biological molecules, cell structure and function, photosynthesis and cellular respiration, the cell cycle, mitosis, meiosis and sexual reproduction, and genetics. This course is taken concurrently with General Biology Laboratory - Cellular.

Prerequisite(s): Corequisite: BIO1015.

Offered at Denver, Providence

4.5 Quarter Credit Hours

BIO1015 General Biology Laboratory - Cellular

This is a laboratory companion course coordinated with BIO1011 that introduces students to techniques and equipment used in experimental biology. Students take an inquiry-based, self-guided learning approach to the discovery of cell structure and function, photosynthesis and cellular respiration, the cell cycle, and genetics. Additionally, this laboratory course provides students with the opportunity to practice laboratory safety, design experimental procedures, collect data, analyze results and discuss conclusions.

Prerequisite(s): Corequisite: BIO1011.

Offered at Denver, Providence

2.25 Quarter Credit Hours

BIO1022 General Biology - Organismal

This course provides an introduction to evolution, the diversity of life on earth, plant and animal form, function, growth, development and reproduction, ecology and ecosystems. This course is taken concurrently with General Biology Laboratory - Organismal.

Prerequisite(s): Corequisite: BIO1025.

Offered at Denver, Providence

4.5 Quarter Credit Hours

BIO1025 General Biology Laboratory - Organismal

This is a laboratory companion course coordinated with BIO1022 that introduces students to techniques and equipment used in experimental biology. Students take an inquiry-based, self-guided learning approach to the discovery of the mechanisms of evolution, plant and animal development, and growth, ecology and ecosystems. Additionally, this laboratory course provides students with the opportunity to practice laboratory safety, design experimental procedures, collect data, analyze results and discuss conclusions.

Prerequisite(s): Corequisite: BIO1022.

Offered at Denver, Providence

2.25 Quarter Credit Hours

BIO2001 Genetics

This course provides students with the knowledge and analytical skills necessary to understand the principles of modern genetics. The nature of genes, genomes and chromosomes; mechanisms of recombination and mutation; Mendelian inheritance patterns; and genetic mechanisms underlying evolution are studied. Genetic studies performed on model organisms (such as bacteria, yeast and mold) are discussed to illustrate and reinforce genetic principles relating to human genetics and diseases.

Prerequisite(s): BIO1011, BIO1015, BIO1022, BIO1025.

Offered at Providence

4.5 Quarter Credit Hours

BIO2021 Functional Human Anatomy

This course studies the functional anatomy of the human organism organized by body systems. The lecture portion explores structural and functional relationships in the human body. The microscopic and macroscopic structure of human tissues, organs and organ systems are examined with applications to health, wellness and disease states. Functional Human Anatomy (lecture and laboratory) is designed to meet prerequisites for graduate programs in the health sciences.

Prerequisite(s): BIO1022 and BIO1025 or SCI1015, Corequisite: BIO2025.

Offered at Denver, Providence

4.5 Quarter Credit Hours

BIO2025 Functional Human Anatomy Laboratory

This course explores the anatomical structure of the human body through the use of anatomical models, dissection of mammalian specimens and examination of prosected human cadavers. A regional/functional perspective is combined with a systemic overview of body systems. Functional Human Anatomy (lecture and laboratory) is designed to meet prerequisites for graduate programs in the health sciences.

Prerequisite(s): BIO1022 and BIO1025 or SCI1015, Corequisite: BIO2021.

Offered at Denver, Providence

2.25 Quarter Credit Hours

BIO2041 Human Physiology

This course examines the molecular, cellular and tissue-level processes involved in the function of human organ systems. Emphasis is on maintenance of internal homeostasis, organ system integration and components of human disease. Concurrent enrollment in BIO2045 Human Physiology Laboratory is required. Human Physiology (lecture and laboratory) is designed to meet prerequisites for graduate programs in the health sciences.

Prerequisite(s): BIO1011 and BIO1015 or SCI1015, CHM1022 and CHM1025 or CHM1000 and CHM1005, Corequisite: BIO2045.

Offered at Denver, Providence

4.5 Quarter Credit Hours

BIO2045 Human Physiology Laboratory

This laboratory course allows students to collect, analyze and apply data to examine and understand human physiologic processes. Activities include experiments, computer simulations and measurement of physiologic activity in human subjects. Equipment commonly found in a medical setting is used. Human Physiology (lecture and laboratory) is designed to meet prerequisites for graduate programs in the health sciences.

Prerequisite(s): BIO1011 and BIO1015 or SCI1015, CHM1022 and CHM1025 or CHM1000 and CHM1005, Corequisite: BIO2041.

Offered at Denver, Providence

2.25 Quarter Credit Hours

BIO2100 Coastal Ecology

This course examines the characteristics of coastal marine habitats, the flora and fauna of these habitats, and their ecological relationships. Anthropogenic effects on coastal habitats are also examined.

Prerequisite(s): BIO1022, BIO1025.

Offered at Providence

4.5 Quarter Credit Hours

BIO2201 General Microbiology

This course introduces the basic morphological, physiological and genetic aspects of various microbes, and explores the application of this information in medical, agricultural and industrial settings. Key topics include structure/function relationships, factors affecting the growth and control of microorganisms, microbial genetics and evolutionary mechanisms, host-microbe interactions, microbial ecosystems, and applied microbiology. Emphasis is on the relationship between developments in the field of microbiology and various aspects of modern society.

Prerequisite(s): (BIO1011/BIO1015 or SCI1015) and (CHM1000/CHM1005 or CHM1022/CHM1025 or CHM2040), Corequisite: BIO2205.

Offered at Denver, Providence

4.5 Quarter Credit Hours

BIO2205 General Microbiology Laboratory

This is a laboratory companion course to be taken concurrently with General Microbiology. Students examine the properties of various microbes and factors affecting the growth and control of microbial agents. Throughout the term, students gain experience in light microscopy, pure culture and enrichment techniques, microbial identification, and enumeration. Emphasis is on appropriate and safe use of standard microbiological and molecular lab equipment and methods, as well as the ability to apply the scientific process.

Prerequisite(s): (BIO1011/BIO1015 or SCI1015) and (CHM1000/CHM1005 or CHM1022/CHM1025 or CHM2040), Corequisite: BIO2201.

Offered at Denver, Providence

2.25 Quarter Credit Hours

BIO3010 Principles of Biochemistry

This course applies the knowledge gained in general and organic chemistry to biological systems. Students gain an understanding of metabolic pathways, energy production, and metabolic regulatory mechanism in eukaryotes and prokaryotes. Students analyze primary journal articles that focus on the application of biochemistry in the health sciences, such as cancer screening, vaccine production and Alzheimer's prevention. Additionally, students research fundamental biochemical techniques such as protein purification and enzyme kinetics.

Prerequisite(s): CHM2022, CHM2025.

Offered at Providence

4.5 Quarter Credit Hours

BIO3040 Molecular Biology

This course provides students the opportunity to use the knowledge gained in genetics and biochemistry to study biology at the molecular level. Students study current topics related to DNA replication, mutation, recombination and gene expression in prokaryotes, eukaryotes and their viruses. Students analyze primary journal articles that focus on the application of molecular biology in the health sciences, such as nutrigenomics, RNAi and epigenetic regulation. Additionally, students debate the ethics behind cloning and the genetic modification of organisms.

Prerequisite(s): BIO2001, BIO3010.

Offered at Providence

4.5 Quarter Credit Hours

BIO3070 Evolution

This course provides a background into the mechanisms of evolution including natural and other forms of selection, and the role of genetic variation, mutations and genetic drift in these processes. Problems associated with classification and inferring phylogenetic relationships between organisms are also examined. Other topics include a history of life on earth, causes of speciation and extinction, coevolution, human evolution and cultural evolution.

Prerequisite(s): BIO1011, BIO1015, BIO1022, BIO1025.

Offered at Providence

4.5 Quarter Credit Hours

BIO4011 Microbiology

This course provides students the opportunity to apply knowledge gained from genetics, biochemistry and molecular biology to microorganisms, with an emphasis on those of importance to the health sciences. Students gain a general understanding of prokaryotic and eukaryotic microscopic life forms, viruses and prions. Students also learn how these microbes cause disease in humans and the immune response system. Students discuss and critically analyze data from journal articles covering hot topics such as bioterrorism, emerging diseases, and genetic engineering. This course, with its laboratory companion, provides a conceptual and experimental background in microbiology sufficient to enable students to take more advanced courses in this field and related fields.

Prerequisite(s): BIO3040, Corequisite: BIO4015.

Offered at Providence

4.5 Quarter Credit Hours

BIO4015 Microbiology Laboratory

This is a laboratory companion course coordinated with BIO4011 Microbiology lecture. Using live cultures, students examine the properties of various microbes and factors that contribute to their spread and control. Unknown bacteria are identified using both traditional and genetic microbiological techniques. Students isolate and identify microorganisms that make up their normal flora. Students also identify other opportunistic microorganisms that are responsible for illness in healthy individuals.

Biosafety procedures are emphasized.

Prerequisite(s): BIO3040, Corequisite: BIO4011.

Offered at Providence

2.25 Quarter Credit Hours

BIO4040 Functional Histology

This course focuses on the relationship between structure and function of the microscopic aspects of mammalian cells, tissues, and organ systems. It begins with examination of the four basic tissue types. This background is then applied to the histological examination human organ systems. Functional relationships are emphasized by contrasting normal and pathological specimens.

Prerequisite(s): BIO2021, BIO2025.

Offered at Providence

4.5 Quarter Credit Hours

BIO4070 Fundamentals of Immunology

This is a survey course that introduces students to basic concepts of immunology and fosters an understanding of the immunological processes that underlie human disease pathogenesis.

Prerequisite(s): BIO1022, BIO1025, BIO3010.

Offered at Providence

4.5 Quarter Credit Hours

BIO4100 Senior Seminar in Biology

This is a capstone biology course that allows students to integrate all previous coursework to examine relevant topics in biology. Each term the course focuses on one such topic, and students are charged with finding, analyzing and critically discussing relevant primary journal articles related to that theme. Additionally, students are assigned a research project, for which they must complete a written report and oral presentation.

Prerequisite(s): BIO1011, BIO1015, BIO1022, BIO1025, CHM1022, CHM1025, MATH2010, senior status.

Offered at Providence

4.5 Quarter Credit Hours