Biology (BIOL)

BIOL 1010 Introductory Biology: Cells, Genetics, and Evolution **(OT36) 3 Credits**
This course introduces basic chemical and cellular levels of life, provides an overview of genetics and evolution, and describes the major taxonomic categories of living organisms. Major topics include basic inorganic chemistry, biochemistry, cell structure and function, energy flow through cells, Mendelian genetics, DNA and proteins, and evolution. This is a non-lab course intended for non-science majors.
(3 contact hours)

BIOL 1020 Introductory Biology: Organismic Biology and Ecology **(OT36) 3 Credits**
This course provides an introduction to the organismic biology of plants and animals, basic ecology, and the effects of human disturbance on the Earth's life support systems. Major topics include plant and animal structure and function, population and community ecology, and environmental impacts. This is a non-lab course intended for non-science majors.
(3 contact hours)

BIOL 1030 Environmental Issues and Solutions **(OT36) 3 Credits**
This course examines the major environmental issues facing the world including pollution, population growth, soil erosion, destruction of forests and other natural areas, climate changes and other environmental impacts induced by human activity. It introduces a wide spectrum of viewpoints on what constitutes an environmental problem, as well as the controversies about appropriate remedial measures. The course analyzes problems and emphasizes the successful search for solutions. It develops a number of themes across a broad range of environmental issues including sustainability, the global economy, the global environment, short-term versus long-term gains, and the trade-off involved in balancing environmental problems and solutions. This non-laboratory course is intended for non-science majors. Because of similarities in content, students who have taken BIOL 1170 Ecology and Environmental Biology should not take this course.
(3 contact hours)

BIOL 1140 Human Biology **(OT36) 3 Credits**
This course introduces the fundamentals of human structure and function at the chemical, cellular, tissue, organ, and system levels. Specific topics include the chemistry of life, cell structure and function, patterns of inheritance and human genetics, and the structure and functions of the body systems. The course includes the study of homeostasis, tissues, and the integumentary, muscular, nervous, endocrine, cardiovascular, respiratory, immune, digestive, urinary, and reproductive systems. This is a non-lab course intended for non-science majors.
(3 contact hours)

BIOL 1150 Plant Biology **(OT36) 4 Credits**
This course provides basic foundations in organismic biology related to plants. It includes the cellular basis of plants, a study of plant cells and tissues, their structure and function, and basic energy relationships of cells. Additionally, the course emphasizes structure, function, taxonomy, ecology, and importance of plants to humans. Lab activities focus on experimental greenhouse studies, observations of plant morphology, and identification of local plant species. This course is intended for non-science majors.
(6 contact hours: 3 lecture, 3 lab)

BIOL 1160 Animal Biology **(OT36) 4 Credits**
This course provides an introduction to organismic biology related to animals. It includes animal cell structure and function, biodiversity and evolution of the animal kingdom, and homeostasis and the organization of the animal body. Additional specific topics include animal tissues; skeletal, muscular, digestive, respiratory, nervous, excretory, and reproductive organs and systems; nutrition and energy flow; importance of animals to humans; inheritance; and behavior. This course includes both lecture and laboratory components and is intended for non-science majors.
(6 contact hours: 3 lecture, 3 lab)

BIOL 1170 Ecology and Environmental Biology **(TM) 4 Credits**
This course provides a framework for understanding basic ecology and environmental science. It gives an introduction and overview of ecological concepts at the population, community, ecosystem, and biosphere levels. Students will examine environmental impacts and solutions in the areas of air, water, and soil pollution; human population growth; energy use and alternatives; and biodiversity and conservation. The course has both a lecture and laboratory component and is intended for non-science majors. Because of similarities in course content, students who have taken BIOL 1030 Environmental Issues and Solutions should not take this course.
(6 contact hours: 3 lecture, 3 lab)

BIOL 1180 Tropical Biology **4 Credits**

This course introduces the concepts of ecology and organismic biology through an intensive field oriented approach. Students examine both tropical rainforests and coral reefs from the organismic, population, community, and ecosystem levels through hands on field activities, lectures, and Internet activities. The course is conducted at a field station in a Costa Rican, Belizean, Amazonian, Caribbean, or Hawaiian location. Multiple field excursions will introduce students to the biodiversity and conservation of tropical ecosystems, while lecture and laboratory activities will introduce concepts in taxonomy, basic organismic biology and adaptive physiology, and tropical ecosystem processes. This course has both a lecture and laboratory (field) component and is intended for non-science majors or as an elective for science majors.
(6 contact hours: 2 lecture, 4 lab)

BIOL 1190 Introduction to Evolutionary Biology **(OT36) 4 Credits**

Prerequisite: high school biology or higher.
This course provides a framework for understanding the concepts of evolutionary biology. It offers an overview of the subject by focusing on the underlying mechanisms that drive change in biological form and function through natural selection. Students will explore the role of ecology, genetics, and development as modulators of change. Special topics will include origins of life, plant and animal evolution, human evolution, evolution of sex, social and behavioral evolution, and infectious disease, as well as alternative views on origins and the socio-political consequences of this theory. This is an elective biology course intended for both science and non-science major students pursuing degrees in biology, healthcare behavior, or education.
(6 contact hours: 3 lecture, 3 lab)

BIOL 1200 Fundamentals of Biology for the Health Technologies **(OT36) 4 Credits**

This course provides an introduction to the concepts and principles of biology for students interested in pursuing a degree in the health sciences. Students seeking a degree in the health sciences are required to take BIOL 1200 if they have not had high school biology and chemistry in the past five years; or CHEM 1100; or a passing score on biology placement test/CLEP test. Major topic areas include biological chemistry, cellular structure and function, and the basic energy relationships of cells. Additionally, this course includes cell division, molecular biology, genetics and heredity, and early embryologic development. This course has both a lecture and laboratory component. Science majors interested in taking BIOL 2210 should take BIOL 1510 prior to taking BIOL 2210.
(6 contact hours: 3 lecture, 3 lab)

BIOL 1510 Principles of Biology I **(OT36) 4 Credits**

Prerequisite: high school biology or BIOL 1010 or permission of instructor.
This course introduces students to the organization of living systems, energy transfer, and continuity of life, biodiversity, and classification of living things for the science major. The topics include biological history, structure and functions of cells and cellular organelles, cell division, general biochemistry, cellular respiration, photosynthesis, DNA structure and function, protein synthesis, heredity, evolution, animal development, and classification. It also introduces viruses, prokaryotes, Protista, and fungi. This course has both a lecture and laboratory component. It provides the prerequisite for BIOL 1520 Principles of Biology II and other advanced courses in biology. Science majors interested in taking BIOL 2210 are advised to take this course prior to BIOL 2210. Students seeking a degree in the health sciences should take BIOL 1200.
(6 contact hours: 3 lecture, 3 lab)

BIOL 1520 Principles of Biology II **(OT36) 4 Credits**

Prerequisite: BIOL 1510 or equivalent.
This course builds on the concepts introduced in BIOL 1510 Principles of Biology I. It provides an overview of the structural and functional characteristics of animals and plants and the basic concepts of ecology. This course introduces the major animal and plant phyla and examines their taxonomic, evolutionary, and organizational relationships, and their life cycles. Additional topics include animal tissues, organs, and organ systems; the structure and function of vascular plants; and ecology. This course has both a lecture and laboratory component. This course and BIOL 1510 provide a general introduction to the biological sciences for the science major.
(6 contact hours: 3 lecture, 3 lab)

BIOL 2010 Genetics **3 Credits**

Prerequisite: BIOL 1200 or BIOL 1510 or permission of instructor.
This lecture-based course, designed for allied health and biotechnology science students, as well as those seeking a degree in Biological Sciences, introduces basic principles of heredity and mechanisms of molecular genetics. Primary topics include the nature of genetic material; patterns of inheritance; transcriptional and translational regulation of gene expressions; genetic variation and how different types of mutation may affect gene function and expression; and evolution genetics, with the emphasis on processes that affect phenotype and genotype frequency in a population. Additional topics include gene therapy and reviewing methods used to analyze gene structure, expression, and function. Also, the course discusses and critiques scientific issues relating to biological ethics in genetics.
(3 contact hours)

BIOL 2210 Anatomy and Physiology I **(OT36) 4 Credits**

Prerequisite: high school chemistry or CHEM 1100, high school biology in the last five years; or BIOL 1200; or passing score on biology placement test/CLEP test.

This course introduces the organization of the human body in the context of the unifying concepts of feedback regulation and homeostasis. The course assumes a general knowledge of cell structure and function and begins with a study of tissues and a general introduction to organs and systems. It then provides detailed study of the integumentary, skeletal, muscular, and nervous systems. This course has both a lecture and laboratory component. This course and BIOL 2220, Anatomy and Physiology II, provide students with a general introduction to the biology of the human body. Students entering health fields are strongly encouraged to take BIOL 1200, Fundamentals of Biology for the Health Technologies; Students pursuing science degrees are strongly encouraged to take BIOL 1510, Principles of Biology I, prior to taking BIOL 2210.

(6 contact hours: 3 lecture, 3 lab)

BIOL 2220 Anatomy and Physiology II **(OT36) 4 Credits**

Prerequisite: BIOL 2210.

This course continues the study of the human body begun in BIOL 2210 Anatomy and Physiology I. The course examines the relationships between endocrine, cardiovascular, lymphatic, respiratory, digestive, reproductive and urinary body systems along with the regulatory mechanisms which integrate them. The course also includes considerations of nutrient absorption and delivery, metabolism, excretory function, and acid-base balance. This course has both a lecture and laboratory component. This course and BIOL 2210 provide students with a general introduction to the biology of the human body.

(6 contact hours: 3 lecture, 3 lab)

BIOL 2700 Microbiology **(OT36) 4 Credits**

Prerequisite: BIOL 1520 or BIOL 2210 or admission to the Biotechnology Science program.

This course, designed for allied health and biotechnology science students, introduces the study of microorganisms and their impact on human health. It focuses on the interactions between human hosts and microbes as well as microbial cell organization, patterns of growth and metabolism, and identifications of medically important microbes. Topics include bacterial cell structure and function; bacterial growth and reproduction; physical and chemical control methods of microbes; relevant characteristics of medically important bacteria; general characteristics of fungi, protozoa, and viruses, and human diseases caused by these microbes; disease transmission; microbial pathogenesis; host defense mechanisms; antimicrobial drugs; and microbial drug resistance. This course has both a lecture and a laboratory component.

(6 contact hours: 3 lecture, 3 lab)

BIOL 2800 Immunology **2 Credits**

Prerequisite: BIOL 1510 or equivalent.

This course introduces the principles and applications of immunology for science majors. It provides basic knowledge of the human immune system, including the molecules, cells, and processes involved in the body's defense against infections. Topics include homeostasis, microbial pathogenicity, structures and functions of the immune systems, immunization, monoclonal antibodies, techniques and applications of immunological tests, immunodeficiency and hypersensitivity, transplantation immunology, and cancer immunology. This is a non-laboratory course.

(2 contact hours)

BIOL 2900 Special Topics in Biology **2-4 Credits**

These specialized courses provide in-depth examinations of biology concepts at the cellular, ecological, or organismic level, which are not covered in detail elsewhere in the curriculum.

(2-4 contact hours)