

BIOLOGY (BIO)

BIO 1000 Biology for Everyday Life (3 Credits)

This lecture-only course is for students pursuing careers outside of science and healthcare (i.e. non-majors). We will explore the foundational concepts of biology to learn how life functions from the molecular level through how organisms interact with the environment. Relevant societal topics and current events will be incorporated to supplement class discussions and course materials.

Prerequisites: eligibility for ENG 1010

General Education: Scientific Knowledge & Understanding (SCKX)

Elective Code(s): Liberal Arts Elective (LART)

BIO 1005 Introduction to Biology (4 Credits)

This is a non-majors level lab science course that focuses on basic chemistry, pH, cell structure and function, metabolism, genetics, evolution, ecology and diversity of life. The use of computers and Blackboard are integral aspects of the course.

Prerequisites: Eligibility for ENG 1010 and MATH 1001 or higher

General Education: Scientific Reasoning (SCRX)

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 105

BIO 1011 Introduction to Nutrition (3 Credits)

A study of the science of nutrition including the chemical structure, function, digestion, absorption, and metabolism of nutrients. Class discussion will emphasize how poor dietary habits and decreased physical activity contribute to the formation of diseases associated with the Western lifestyle. Students critically analyze their own diets with respect to nutritional content and adequacy. This course will not meet program requirements for the Dietetic Technician program.

Prerequisites: Eligible for ENG 1010 or ENG 0910

General Education: Scientific Knowledge & Understanding (SCKX)

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 111, NTR* 106

BIO 1023 Biology of Disease (3 Credits)

This course is designed for students entering into the health professions. This course will cover the essential fundamentals of major types of diseases, it will also cover the basics of diagnosis and treatment. Students will review the basic anatomy and physiology of each organ system while exploring the diseases of each system.

Prerequisites: Basic Skills Assessment placement at ENG 1010 level.

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 123

BIO 1040 Pestilence, Plagues, and People (3 Credits)

This survey course selects diseases and studies their impacts and influences on societies and cultures, with an emphasis on the Western world.

Prerequisites: Placement into ENG 1010

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 200

BIO 1098 Topics of Interest in Biology (3 Credits)

This course covers topics of special interest in biology at the introductory (1000s) level. Topics vary by campus and semesters and are meant to address current and relevant biology topics.

Prerequisites: Eligibility for ENG 1010 and MATH 1001 or higher

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 198

BIO 1100 Principles of the Human Body (3 Credits)

This non-STEM (Science, Technology, Engineering, and Math) majors natural science course is designed to introduce students to basic principles required to support human life. The cellular nature of life and organization and function of organs and organ systems is emphasized. Students use a variety of resources from readings to media to case studies to acquire and evaluate relevant scientific content. Select body systems and disease states are discussed. This course cannot be used as the prerequisite for BIO 2111 or BIO 2350.

Prerequisites: Eligibility for ENG 0910

General Education: Scientific Knowledge & Understanding (SCKX)

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 110

BIO 1100L Principles of the Human Body Lab (1 Credits)

This non-STEM (Science, Technology, Engineering, and Math) majors laboratory course compliments BIO 1100. It is designed to be an active introduction to the basic structure and function of a human body, including animal cells and tissues through human organ systems. This course cannot be used as the prerequisite for BIO 2111 or BIO 2350.

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 110L

BIO 1111 Cell Biology with Organ Systems (4 Credits)

This one-semester laboratory science course covers principles of cell biology, including basic biological chemistry, cell structure and function, cell division, cellular respiration, deoxyribonucleic acid (DNA) replication and protein synthesis. These concepts are applied to a study of the structure and function of the major organs systems in the human body. This course can be used as a prerequisite for BIO 2111 and BIO 2350.

Prerequisites: Eligibility for ENG 1010; recent college preparatory biology recommended

General Education: Scientific Reasoning (SCRX)

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 115 or BIO* 127

BIO 1118 Anatomy and Physiology of the Eye (4 Credits)

Open only to students enrolled in the Ophthalmic Design & Dispensing program. Designed to introduce the student to the basic anatomy and physiology of the eye, this course will include study of the eye and its associated structures. Student will conduct a detailed study of the eyelids and lashes, the orbit, extra ocular muscles, the crystalline lens, the retina, lacrimal apparatus, uveal tract, and the cornea. Included in the course is the certification in Adult CPR, a segment on A.I.D.S. awareness, and a study of medical abbreviations and commonly used medical prefixes and suffixes. The laboratory component of the course includes dissection of cow's eye, as well as numerous slide and video presentations of ocular anatomy, physiology, and surgery.

General Education: Scientific Reasoning (SCRX)

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 118

BIO 1210 General Biology I (4 Credits)

This is a Science, Technology, Engineering, and Mathematics (STEM) majors level lab science course that focuses on aspects of plant, animal and bacterial cell biology. Cellular biochemistry, including cellular respiration and photosynthesis, reproduction, genetics and evolution will be covered. The use of computers and Blackboard are integral aspects of the course. This course can be used as a prerequisite for BIO 2111 and BIO 2350.

Prerequisites: Eligibility for ENG 1010 and MATH 1010. In addition, completion of High School or CHEM 1110 or higher is recommended.

General Education: Scientific Reasoning (SCRX)

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 121

BIO 1220 General Biology II (4 Credits)

This lab science course focuses on the biology of organisms including structure and function, nutrition, life cycles, and ecological relationships; and the origin and evolution of life. Topics to be covered include taxonomy, the diversity of life forms from the microbes to the animals, the structures and functions of fungal, plant, and animal systems, as well as ecology, ecosystems and evolution.

Prerequisites: Eligibility for ENG 1010 and MATH 1010

General Education: Scientific Knowledge & Understanding (SCKX)

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 122

BIO 1550 Botany (4 Credits)

For non-science AND science majors. This lab science course focuses on an introduction to the study of the structure, reproduction, and physiology of plants. The evolutionary development of the plant kingdom will be stressed, as will their ecological and economical significance. Laboratory classes will include fieldwork to provide hands-on experience in identification of plant species and the role of plants in nature. Projects in lab will emphasize the importance of plants in human society. The use of computers and Blackboard are integral aspects of the course.

Prerequisites: Eligible for ENG 0910

General Education: Scientific Reasoning (SCRX)

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 155

BIO 1710 Field Biology (4 Credits)

Lecture-laboratory. This is an introduction to field ecology with special emphasis on identification of Connecticut plants and animals in the outdoors. A wide range of topics will be presented including map reading, edible wild foods, specimen collecting, herbarium preservation, and wildlife observations.

Prerequisites: Completion of MATH 0900 with a grade of C or higher or an appropriate score on a college placement exam, and eligibility for ENG 1010.

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 171

BIO 1720 General Ecology (4 Credits)

Ecology is the study of interactions: between individuals of the same or different species and between living and non-living parts of the Earth.

These interactions will be studied in the context of deep and recent evolutionary history and biodiversity. Students will explore ecological principles focusing on the factors that influence the distribution and abundance of organisms. Current biodiversity and environmental issues are linked to class topics. Lab data (including from locations in outdoor habitats of Connecticut) may include collecting information on population growth, competition, species interactions, trophic dynamics, habitat description, animal behavior, climate modeling, and biodiversity/community analysis, among others. The use of computers and Blackboard are integral aspects of this course. This course is suitable for environmental science/natural resources majors and non-science majors.

Prerequisites: Eligibility for ENG 1010

General Education: Scientific Reasoning (SCRX)

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO*173, BIO* 178

BIO 1750 Introduction to Marine Science (3 Credits)

This course is an introduction to the world's oceans and explores both living and nonliving components. A major focus of the course is on groups of plants and animals in various marine environments, as well as their interactions with each other. In addition, the geological and chemical features of the oceans are examined as are the uses, and impacts, of humans in ocean systems.

Prerequisites: eligibility for ENG 1010 and MATH 1001 or higher

General Education: Scientific Knowledge & Understanding (SCKX)

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 175

BIO 1760 Introduction to Marine Biology (3 Credits)

This is an introductory course in marine biology. Major topics will include marine organisms and ecology with a specific focus on the intertidal zone. Additional topics include energy transfer, organismal biology, adaptations to seawater, and marine habitats. Plankton will be featured as will the geomorphology of the New England coast. Some fieldwork may be required.

Prerequisites: Eligibility for ENG 1010 and MATH 1001 or higher

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 176

BIO 1809 Principles of Biotechnology (3 Credits)

Students will be introduced to key elements in the exciting and rapidly advancing field of biotechnology. This course will provide students with a brief historical context, the basic scientific knowledge needed to understand biotechnology, a survey of current and future applications of the technology and an examination of the legal and ethical limitations placed on the technology throughout the globe. This course is intended for students in the biotechnology program and students exploring career options in the field of science; therefore, résumé and cover letter writing skills will be emphasized.

Prerequisites: Eligible for ENG 1010

General Education: Global Knowledge (GLKY), Scientific Knowledge & Understanding (SCKX)

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 109

BIO 1810 Basic Techniques in Biotechnology (4 Credits)

Through a combination of hands-on laboratory experimentation and lectures, students gain experience in molecular biology and biotechnology using state-of-the-art laboratory equipment. These skills include accurate pipetting, basic microscopy, preparation of solutions, aseptic technique and bacterial cultures, genomic DNA isolation, plasmid purification, DNA quantification, agarose gel electrophoresis, and PCR amplification. Students are exposed to the field of bioinformatics and its applications in bioscience research, specifically the utility of the National Center for Biotechnology Information resources. Students explore the bioethics of biotechnology in the context of contemporary societal issues.

Prerequisites: Eligibility for ENG 1010 and MATH 1001 or higher
General Education: Scientific Knowledge & Understanding (SCKX)

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 130

BIO 2010 Nutrition and Human Development (3 Credits)

This course will examine nutrition throughout the human life cycle. Nutrition during periconception, pregnancy, lactation, childhood, adolescence and adulthood will be reviewed. The course will also examine nutrition in public health in both the developed and developing world.

Prerequisites: BIO 1011

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 210

BIO 2020 Biochemistry (4 Credits)

This intermediate level course focuses on the structure, function, and properties of biological molecules. The organization of amino acids, lipids, carbohydrates, and nucleic acids are addressed through a discussion of their hierarchical structure, their assembly into essential complexes in biological systems, and their relationship to human disease. Protein function is examined through the study of enzyme kinetics, the characterization of major metabolic pathways, and the interconnectivity of these pathways in tightly regulated networks.

Prerequisites: BIO 1210 and CHEM 1220 both with a "C-" or higher OR CHEM 2310 with a "C-" or higher OR Instructor's permission

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 220

BIO 2095 Biotechnology Internship (3 Credits)

Student will work a minimum of 160 hours in an industrial or research biotechnology laboratory to learn new research skills and apply skills learned in laboratory courses.

Prerequisites: Permission of the Biotechnology Program Coordinator

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 296

BIO 2098 Special Topics in Biology (3-4 Credits)

This course covers topics of special interest in biology for biology majors. Topics vary by campus and semesters and are meant to address current and relevant biology topics.

Prerequisites: BIO 1210, and CHEM 1010 and ENG 1010, all with a C or higher

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 298

BIO 2103 Pathophysiology (3 Credits)

This course provides an introduction to the study of functional changes that accompany human diseases. The purpose of this course is to supply students with a basic understanding which will prepare them for the healthcare setting. This course places emphasis on the disease processes affecting the human body through an integrated approach to specific disease entities, including the study of causes, diagnosis and treatment of disease. The most common conditions along with new and emerging diseases will be included.

Prerequisites: BIO 1111 or BIO 2112

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 203

BIO 2111 Anatomy and Physiology I (4 Credits)

This course is the first semester of a two-semester sequence that provides a comprehensive study of the structure and function of the human body. Anatomy and Physiology I covers terminology, tissues, integumentary, skeletal, muscular, and nervous systems and their relationships to other systems. The physiology of movement is emphasized. Selected pathology examples are examined. Students study the relationship between structure and function using interactive physiology software, diagnostic imaging, dissection, and histology slides. The use of computers and Blackboard are integral aspects of this course.

Prerequisites: ENG 1010 AND BIO 1210 or

BIO 1111 or (BIO 1005 AND CHEM 1110) - all with a "C" or higher

General Education: Scientific Reasoning (SCRX)

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 211

BIO 2112 Anatomy and Physiology II (4 Credits)

A study of the structure and function of the human body. Includes a detailed analysis of the endocrine, digestive, respiratory, cardiovascular, immune and lymphatic, urinary and reproductive systems. Pathology and disease applications are covered. Students examine the relationship between structure and function using interactive anatomy software, laboratory dissection, interactive physiology software, and histology slides. The use of computers and Blackboard are integral aspects of this course.

Prerequisites: BIO 2111 with a C or higher

General Education: Scientific Knowledge & Understanding (SCKX)

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 212

BIO 2121 Human Cadaver Anatomy (4 Credits)

Explores the human anatomy integrating online course work and human cadaver dissection.

Prerequisites: BIO 2111 and BIO 2112 with B+ or higher in both classes OR Permission from instructor

Previous: Legacy Equivalent(s): BIO 213

BIO 2122 Survey of the Human Cadaver (1 Credits)

This course is a survey of a prosected human cadaver. All organ systems are studied with special reference to clinical significance,

Prerequisites: BIO 2111 with a grade of C or higher

Previous: Legacy Equivalent(s): BIO 217

BIO 2350 Microbiology (4 Credits)

This course is a comprehensive study of microorganisms. Topics covered will include the basic characteristics, morphology, physiology, growth, reproduction, and genetics of bacteria, as well as a brief taxonomical survey of the following microbial life forms: Archaea, Bacteria, Fungi, Protists and Viruses. Laboratory activities will include performing various techniques of microscopy, staining, culturing, and isolating bacteria. The morphology and metabolic processes of select microbial groups will be studied. Students will learn to apply various modern biological techniques that are used for controlling the growth of microbes, and to identify unknowns. The use of computers and Blackboard are integral aspects of the course.

Prerequisites: BIO 1005 OR BIO 1210 OR BIO 1111, AND CHEM 1110 or higher, AND ENG 1010. All with a 'C' or higher.

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 235

BIO 2600 Principles of Genetics (3 Credits)

This is an intermediate level course in genetics providing a broad view of the history, theory and application of classical and modern molecular genetics. Topics include Mendelian genetics, mitosis and meiosis, chromosomal theory, human genetics, and molecular genetics. The course will also emphasize ethical considerations for the use of gene therapy and reproductive technology.

Prerequisites: BIO 1210 with a "C" or higher

General Education: Scientific Knowledge & Understanding (SCKX)

Elective Code(s): Liberal Arts Elective (LART)

Previous: Legacy Equivalent(s): BIO* 260

BIO 2630 Molecular Genetics (4 Credits)

This is an advanced course that covers the main concepts of genetics including the theory of chromosomal inheritance, classical Mendelian inheritance, principles of human genetics, the molecular basis of development, the role of nucleic acids in gene expression, genetic mutations, population genetics and topics in modern genetics in areas such as epigenetics, recombinant deoxyribonucleic acid (DNA), biotechnology, gene mapping, bioinformatics and diagnosis of human genetic diseases. The laboratory portion of this course will emphasize genetic crosses, molecular diagnostic techniques, and calculating genetic variation in populations.

Prerequisites: CHEM 1120 or BIO 1210 or BIO 2350 with a C or higher

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 262 and BIO* 263

BIO 2700 Ecology (4 Credits)

This majors-level course serves as a deep inquiry of important ecological topics. Review, analyses, and discussion of primary scientific literature is a core of this course. Dynamic processes in populations, communities, and ecosystems are reviewed and investigated in both lab and lecture. Sub-topics include ecosystem characteristics and adaptations, biodiversity, genetics, speciation, trophic interactions, biogeochemical cycling, community energetics, conservation biology, and local/global ecological issues. Outdoor field laboratory studies are required. Problem-solving, scientific communication, and exposure to fine-scale ecological research techniques and applied statistics are stressed. Field labs provide context on topics covered in lecture and may include: physical constraints, population dynamics, competition, species interactions, habitat classification, community structure analysis, animal behavior, and conservation biology. The use of computers and Blackboard are integral aspects of the course.

Prerequisites: BIO 1210 and ENG 1010, and MATH 1200 all with a C or higher.

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 270

BIO 2822 Molecular Biotechniques (4 Credits)

A laboratory course designed to introduce molecular biology techniques such as plasmid and chromosomal Deoxyribonucleic Acid (DNA) isolation, restriction enzyme mapping, agarose gel electrophoresis, and manipulation of DNA fragments. Students will prepare independent research projects that will be presented as either scientific poster or oral research presentations.

Prerequisites: CHEM 1120 or higher AND BIO 2350

General Education: Global Knowledge (GLKY)

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 222

BIO 2830 Advanced Techniques in Biotechnology (4 Credits)

In this combined lecture-lab course, students gain hands-on experience with the expression, purification and characterization of recombinant proteins. Through a series of process-oriented guided inquiry learning labs students will gain working knowledge of bioinformatics, molecular cloning, purification of recombinant proteins, and enzymatic reaction rates. Students perform experiments involving ion-exchange and affinity chromatography, Bradford Assay, SDS-PAGE, immunoblotting, and enzymatic activity assays.

Prerequisites: Grade C or higher in BIO 1210 And CHEM 1210

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 230

BIO 2840 Fundamentals of Biomanufacturing (4 Credits)

This course provides a comprehensive overview of the principles and practices employed in the production of biological products. Students will explore the fundamental concepts of cell culture and microbial fermentation, essential for generating therapeutic proteins, foods, beverages, and other bioproducts. A significant portion of the course is dedicated to fermentation science, encompassing media formulation, strain selection, and process optimization. Practical aspects of bioreactor operation, including design, control, and scale-up, will be thoroughly examined. Finally, students will gain insight into downstream processing and regulatory considerations relevant to the biomanufacturing industry.

Prerequisites: BIO 1210 - General Biology I or permission of a

Biotechnology program coordinator

Additional fees may apply

BIO 2865 Principles of Synthetic Biology (4 Credits)

The study of synthetic biology combines principles of molecular biology, genetics, and biochemistry, to engineer bacteria to do useful things. Students will apply their knowledge of bacterial and eukaryotic regulatory process to manipulate biological parts to generate devices and complex systems. Students will review the seminal findings in the field of synthetic biology, as well as examine the bioethical implications of the field.

Prerequisites: BIO 1210 and CHEM 1210 with a C or higher

Elective Code(s): Liberal Arts Elective (LART)

Additional fees may apply

Previous: Legacy Equivalent(s): BIO* 265