BIOLOGY (BIO)

BIO 101. General Biology I. 3 Credits.
This course considers the basic concepts of life science with emphasis on the methods of science and the role of science in society, ecological principles, evolutionary mechanisms, meiosis and genetics, biological molecules, and transcription/translation. This course is primarily for students in health science programs or in the School of Engineering. First semester of a full-year course; must be taken in sequence. Must be taken in conjunction with BIO 101L.
Corequisites: Take BIO 101L.
Offered: Every year, All
UC: Natural Sciences

BIO 101H. Honors General Biology I. 3 Credits.
This course considers the basic concepts of life science with emphasis on the methods of science and the role of science in society, ecological principles, evolutionary mechanisms, meiosis and genetics, biological molecules, and transcription/translation. This course is primarily for students in health science programs or in the School of Engineering. First semester of a full-year course; must be taken in sequence. Must be taken in conjunction with BIO 101HL.
Corequisites: Take BIO 101HL;
Offered: As needed, Fall
UC: Natural Sciences

BIO 101HL. Honors General Biology I Lab. 1 Credit.
Lab to accompany BIO 101H (2 lab hours). Selected projects develop skills in experimental design, data analysis and scientific writing. Must be taken in conjunction with BIO 101H.
Corequisites: Take BIO 101H;
Offered: As needed, Fall
UC: Natural Sciences

BIO 101L. General Biology I Lab. 1 Credit.
Lab to accompany BIO 101 (2 lab hours). Selected projects develop skills in experimental design, data analysis and scientific writing. Must be taken in conjunction with BIO 101.
Corequisites: Take BIO 101.
Offered: Every year, All
UC: Natural Sciences

BIO 102. General Biology II. 3 Credits.
This course considers the basic concepts of life science with emphasis on the methods of science and the role of science in society, the chemistry of life, and molecular and cellular evolution. Selected topics include cellular biochemistry, DNA replication, regulation of gene expression, cell structure and function, respiration and photosynthesis, cell cycle, and cellular communication. This course is primarily for students in health science programs or in the School of Engineering. Second semester of a full-year course; must be taken in sequence. Must be taken in conjunction with BIO 102L.
Prerequisites: Take BIO 101 and BIO 101L or BIO 101H and BIO 101HL; Minimum grade C-.
Corequisites: Take BIO 102L.
Offered: Every year, Spring and Summer
UC: Natural Sciences

BIO 102H. Honors General Biology II. 3 Credits.
This course considers the basic concepts of life science with emphasis on the methods of science and the role of science in society, the chemistry of life, and molecular and cellular evolution. Selected topics include cellular biochemistry, DNA replication, regulation of gene expression, cell structure and function, respiration and photosynthesis, cell cycle, and cellular communication. This course is primarily for students in health science programs or in the School of Engineering. Second semester of a full-year course; must be taken in sequence. Must be taken in conjunction with BIO 102HL.
Prerequisites: Take BIO 101and BIO 101L or BIO 101H and BIO 101HL; Minimum grade C-;
Offered: As needed, Spring
UC: Natural Sciences

BIO 102L. General Biology Lab II. 1 Credit.
Lab to accompany BIO 102 (2 lab hrs.). Selected projects develop skills in experimental design, data analysis and scientific writing. Must be taken in conjunction with BIO 102.
Prerequisites: Take BIO 101, BIO 101L; Minimum grade C-.
Corequisites: Take BIO 102.
Offered: Every year, Spring and Summer
UC: Natural Sciences

BIO 103. Concepts in Human Biology. 3 Credits.
This course introduces students to foundational molecular, cellular and physiological principles in biology through a survey of the human organ systems. Emphasis is placed upon practical knowledge critical to students pursuing a career in health professions. The course is primarily for students in occupational therapy, physical therapy, diagnostic medical sonography, and radiologic sciences.
Prerequisites: None
Offered: Every year, Fall and Spring

BIO 104. Fundamental Life Processes. 3 Credits.
This course is an introduction to fundamental life processes in humans. Emphasis includes the molecular biology of microand macromolecules, chemical reactions and enzymes, and the structure, function, and energy transformations of cells. Cell division, the central dogma, and introductory genetics are introduced with applications to human disease. This course is primarily for nursing majors. A minimum grade of C is required for progression to Anatomy and Physiology I (BIO 211) and the accompanying lab (BIO 211L). Must be taken in conjunction with BIO 104L.
Corequisites: Take BIO 104L
Offered: Every year, Spring and Summer
UC: Natural Sciences

BIO 104L. Fundamental Life Processes Lab. 1 Credit.
This lab course complements the lecture course (BIO 104) as an introduction to fundamental life processes in humans. The laboratory will provide for hands-on applications of the study of water, biomolecules, cell structure, membrane transport, enzyme activity, metabolism, mitosis, genetics and transcription/translation. Connections to clinical conditions and human diseases will be made. This course is primarily for nursing majors.
Corequisites: Take BIO 104
Offered: Every year, Spring and Summer
UC: Natural Sciences

BIO 106. Science and Society: Concepts and Current Issues. 3 Credits.
This course introduces natural science to the nonscientist with an emphasis on problems confronting society. Current health and scientific issues in the news are emphasized to help students recognize the importance of science in their daily lives. This course is designed for nonscience majors. May not be taken for credit concurrently with or after completion of BIO 161. Must be taken in conjunction with BIO 106L.
Corequisites: Take BIO 106L.
Offered: As needed
UC: Natural Sciences

BIO 106L. Science and Society: Concepts and Current Issues Lab. 1 Credit.
Lab to accompany BIO 106 (2 lab hours.) May not be taken for credit concurrently or after completion of BIO 161. Must be taken in conjunction with BIO 106.
Corequisites: Take BIO 106.
Offered: As needed
UC: Natural Sciences

BIO 107. Everyday Biology. 3 Credits.
This project-based lecture course introduces the non-scientist to relationships between biological principles and everyday life. Students will discuss and explore the application of basic biological principles to current topics including cancer, health, addiction, immunity, photosynthesis, evolution, sustainability, and the environment. This course is designed for non-science majors. Must be taken in conjunction with BIO 107L.
Corequisites: Take BIO 107L
Offered: Every year, All
UC: Natural Sciences

BIO 107L. Everyday Biology Lab. 1 Credit.
Lab to accompany BIO 107 (2 lab hours). This laboratory course, designed for non-science majors, emphasizes exploration of the natural sciences. Laboratory experiments will focus on problems confronting society, including relationships between humans and the environment. Must be taken in conjunction with BIO 107.
Corequisites: Take BIO 107
Offered: Every year, All
UC: Natural Sciences

BIO 120. The Biology of Beer. 3 Credits.
This lecture course uses the biological processes of beer production and consumption as a framework for examining basic principles of molecular, cellular and organismal biology. Students begin by studying the life cycle of the brewer's yeast and the process of fermentation. They then consider how the human body responds to beer, and finally, they examine the biological basis of alcoholism and fetal alcohol syndrome. This course is designed for nonscience majors.
Prerequisites: None
Offered: As needed
UC: Natural Sciences

BIO 125. Cross My Heart: An Introduction to the Human Cardiovascular System. 3 Credits.
Heart and blood vessel disease is the leading cause of death in both men and women. This lecture course is designed for non-science majors interested in examining basic principles of the anatomy and physiology of the heart, and in understanding common disease conditions. Discussion focuses on risk factors and steps to preventing disease. An overview of common diagnostic tests and treatments introduces students to the identification and management of common disorders. May not be taken for credit concurrently with or after completion of BIO 212 or BIO 350.
Prerequisites: None
Offered: As needed
UC: Natural Sciences

BIO 128. Global Health Challenges: a Human Perspective. 3 Credits.
This course addresses a series of topics that elucidate and address challenges in global public health, with an emphasis on neglected tropical diseases and the profound impact that they have on humanity. Biological information concerning the etiology, pathology and epidemiology of the diseases is presented at the level of the nonscientist. Emphasis is placed on the impacts of such diseases on education, socioeconomics and stigmatization. Must be taken in conjunction with BIO 128L.
Corequisites: Take BIO 128L.
Offered: Every year, Spring
UC: Natural Sciences

BIO 128L. Global Health Challenges Lab. 1 Credit.
Lab to accompany BIO 128L (2 lab hours). Selected projects introduce students to the basics of the scientific method, experimental design, data analysis and scientific writing. Must be taken in conjunction with BIO 128.
Corequisites: Take BIO 128.
Offered: Every year, Spring
UC: Natural Sciences

BIO 150. General Biology for Majors. 4 Credits.
Students develop sound learning strategies and introductory knowledge within five core concepts in biology: science as a way of knowing, chemistry of life, structure and function relationships; major pathways and transformations of energy and matter, as well as living systems as interactive and interconnected. This is the first course of a three-course sequence for biology and related majors. Must be taken in conjunction with BIO 150L.
Corequisites: Take BIO 150L.
Offered: Every year, Fall
UC: Natural Sciences

BIO 150L. General Biology for Majors Laboratory. 0 Credits.
Lab to accompany BIO 150 (3 lab hours). Students take an investigative/inquiry-based approach and become competent within the process of science including experimental design and analysis, as well as scientific communication and collaboration. Must be taken in conjunction with BIO 150.
Corequisites: Take BIO 150.
Offered: Every year, Fall
UC: Natural Sciences

BIO 151. Molecular and Cell Biology and Genetics. 4 Credits.
Students investigate key concepts in molecular and cell biology and genetics. Topics include evolution, the central dogma, regulation of gene expression, cell communication, classical genetics, immunology, cancer and cell division. Must be taken in conjunction with BIO 151L.
Prerequisites: Take BIO 150, BIO 150L; Minimum grade C-.
Corequisites: Take BIO 151L.
Offered: Every year, Spring
UC: Natural Sciences

BIO 151L. Molecular and Cell Biology and Genetics Lab. 0 Credits.
Lab to accompany BIO 151 (3 lab hours). Selected projects enable students to develop skills in experimental design through an investigative/inquiry-based approach, data analysis and scientific writing. Must be taken in conjunction with BIO 151.
Prerequisites: Take BIO 150, BIO 150L; Minimum grade C-.
Corequisites: Take BIO 151.
Offered: Every year, Spring
UC: Natural Sciences

BIO 161. Introduction to the Biological Aspects of Science and Society. 3 Credits.
This course introduces natural science to the nonscientist with an emphasis on current problems confronting society. Current health and scientific issues in the news are emphasized to help students recognize the importance of science in their daily lives. This course is designed for nonscience majors. May not be taken for credit concurrently or after completion of BIO 106.
Prerequisites: None
Offered: As needed
UC: Natural Sciences

BIO 202. Inside Out: An Introduction to Human Form and Function. 3 Credits.
This course is designed for non-science majors interested in learning about the foundational principles of human anatomy and physiology–what we look like on the inside and how it all fits together. Emphasis is placed on the language of anatomy and the structure and function of the skeletal and muscular systems; the course also examines the cardiovascular, nervous, respiratory, digestive, urinary, and reproductive systems. Featuring an innovative format with hands-on learning at the forefront, students will explore real human bones and anatomical models with the support of a 3D anatomy visualization program, perform guided dissections of select animal specimens, and generate real-time physiological data from their own bodies. Real-world applications to careers and clinical correlates will be integrated into weekly activities and formal assessments. May not be taken for credit concurrently with or after completion of BIO 211 or BIO 212.
Prerequisites: None
Offered: As needed, Spring and Summer
UC: Natural Sciences

BIO 203. How Drugs Affect Your Body. 3 Credits.
This course is designed for non-science majors and will focus on several commonly prescribed and/or used drugs (prescription, over the counter, illegal drugs) and how they affect the human body. Topics will include an introduction to cellular structure and function, human anatomy & physiology, drug delivery and metabolism, drug mechanisms of action in the body, and health inequities. Must be taken in conjunction with BIO 203L.
Corequisites: Take BIO 203L.
Offered: As needed
UC: Natural Sciences

BIO 203H. How Drugs Affect Your Body. 3 Credits.
This course is designed for non-science majors and will focus on several commonly prescribed and/or used drugs (prescription, over the counter, illegal drugs) and how they affect the human body. Topics will include an introduction to cellular structure and function, human anatomy & physiology, drug delivery and metabolism, drug mechanisms of action in the body, and health inequities. Must be taken in conjunction with BIO 203HL.
Corequisites: Take BIO 203HL.
Offered: As needed
UC: Natural Sciences

BIO 203HL. How Drugs Affect Your Body Lab. 1 Credit.
This laboratory course, designed for non-science majors, emphasizes virtual lab simulations and experiments to further explore and apply concepts learned in lecture. Lab experiments will focus on cardiovascular, respiratory, and nervous system anatomy and physiology, mitosis, cell cycle, drug effects on the heart, immunological detection of disease, and the detection of cancer. Must be taken with BIO 203.
Corequisites: Take BIO 203H.
Offered: As needed
UC: Natural Sciences

BIO 203L. How Drugs Affect Your Body Lab. 1 Credit.
This laboratory course, designed for non-science majors, emphasizes virtual lab simulations and experiments to further explore and apply concepts learned in lecture. Lab experiments will focus on cardiovascular, respiratory, and nervous system anatomy and physiology, mitosis, cell cycle, drug effects on the heart, immunological detection of disease, and the detection of cancer. Must be taken with BIO 203.
Corequisites: Take BIO 203.
Offered: As needed
UC: Natural Sciences

BIO 205. Bioethics. 3 Credits.
This course explores major ethical issues arising from advances in biomedical technology, such as when human life begins, the ethics of assisted reproduction, cloning, stem cell research and genetic engineering, among others. Emphasis is on understanding the science behind the various biotechnologies and applying sound moral reasoning to the ethical issues discussed.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 103 or BIO 104 and BIO 104L or BIO 151 or ENV 101 or PL 101 or PS 101.
Offered: As needed, Spring
UC: Natural Sciences

BIO 207. Coral Reef Organismal Diversity - An Immersive Approach. 3 Credits.
In this hands-on course, participants focus on a series of topics related to coral reef and marine ecology, with an emphasis on adaptations to underwater life, conspecific and interspecific relationships, and the role conservation and education play in developing responsible tourism practices. Students study the underwater world in a way that relatively few people do: directly via SCUBA diving in Bonaire, Netherlands Antilles. Students are expected to complete multiple dives per day and use their observations to discuss reef structure, animal behavior, conservation and eco-tourism. By the start of the course, students must either possess (at a minimum) Open Water SCUBA certification or have completed the online portion of PADI Open Water Certification with the understanding that they will complete the practicum portion in the first two days on Bonaire.The travel component of this course will occur in the summer.
Prerequisites: None
Offered: As needed, Spring
UC: Natural Sciences

BIO 208. Introduction to Forensic Science. 3 Credits.
This course begins with a historical overview of the discipline as a method of understanding the contemporary field of forensics. Scientific principles and practices are applied to specific examples within crime scene and evidence analysis including, but not limited to physical evidence, glass and soil, organic and inorganic substances, hair and fibers, toxicology, serology and fingerprinting. Additionally, students utilize FBI cases, popular press and television to evaluate the use of science and distinguish among science, law and entertainment. Must be taken in conjunction with BIO 208L.
Corequisites: Take BIO 208L.
Offered: Every year, Spring
UC: Natural Sciences

BIO 208L. Introduction to Forensic Science Lab Science Laboratory. 1 Credit.
Lab to accompany BIO 208 (3 lab hours). Students develop skills in observation, measurement, microscopy, glass fracture patterns, soil and footprint analysis, chromatography, spectrophotometry, hair and fiber analysis, fingerprinting and DNA analysis. The culmination of the laboratory experience involves synthesis of lecture and laboratory activities into a single class project that begins with control of a simulated crime scene and evidence search patterns, and continues through processing evidence, evidence analysis and presentation of results. Must be taken in conjunction with BIO 208.
Corequisites: Take BIO 208.
Offered: Every year, Spring
UC: Natural Sciences

BIO 211. Human Anatomy and Physiology I. 3 Credits.
This advanced course provides a comprehensive analysis of human anatomy and physiology, including a detailed examination of molecular and cellular aspects of cell and organ function and metabolism incorporated with system physiology in the human body. Systems studied in the course include integumentary, skeletal, muscle, nervous, special senses and endocrine. Emphasis is on function and homeostasis. Relevant diseases also are presented. Primarily for students in bachelor's degree health science programs. First semester of a full-year course; must be taken in sequence. Must be taken in conjunction with BIO 211L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 103 or BIO 104 and BIO 104L or BIO 151. Minimum grade C-.
Corequisites: Take BIO 211L.
Offered: Every year, All

BIO 211L. Human Anatomy and Physiology Lab I. 1 Credit.
Lab to accompany BIO 211(3 lab hours). A detailed study of themajor body systems utilizing anatomical models, cadavers, animal specimens, histological slides, physiological experiments and simulations. Must be taken in conjunction with BIO 211.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 103 or BIO 104 and BIO 104L or BIO 151 Minimum Grade C-.
Corequisites: Take BIO 211.
Offered: Every year, Fall and Summer

BIO 212. Human Anatomy and Physiology II. 3 Credits.
This course is a continuation of BIO 211 with an emphasis on the anatomy and physiology of the major body systems. Systems studied in this course include cardiovascular, lymphatic, immune, respiratory, urinary, digestive and reproductive. Emphasis is on structure, function, interdependence and the maintenance of homeostasis. Relevant diseases also are presented. Primarily for students in bachelor's degree health science programs. Second semester of a full-year course; must be taken in sequence. Must be taken in conjunction with BIO 212L.
Prerequisites: Take BIO 211, BIO 211L; Minimum grade C-.
Corequisites: Take BIO 212L.
Offered: Every year, Spring and Summer

BIO 212L. Human Anatomy and Physiology II Lab. 1 Credit.
Lab to accompany BIO 212 (3 lab hours). A detailed study of the major body systems utilizing anatomical models, cadavers, animal specimens, histological slides, physiological experiments and simulations. Must be taken in conjunction with BIO 212.
Prerequisites: Take BIO 211, BIO 211L; Minimum grade C-.
Corequisites: Take BIO 212.
Offered: Every year, Spring and Summer

BIO 215. Environmental Biotechnology. 3 Credits.
This course focuses on foundational components of biotechnology, with an emphasis on microbial ecology, microbial metabolism and the importance of microorganisms in the environment. Students will learn about the traditional and emerging environmental biotechnological approaches currently being employed to address environmental problems and achieve a working knowledge of the science involved in wastewater treatment, clean-up of industrial waste streams, bioremediation, and bioenergy production with focus on recent progress and novel approaches that offer new insights into environmental biotechnology. Students will also engage in the scientific process, working in small groups on a project of their own design, and producing and delivering a professional in-class presentation.
Prerequisites: Take ENV 101 or BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Offered: Every other year, Spring

BIO 221. Plastics - Miracle Or Curse?. 3 Credits.
In this course, we will attempt to answer the following question: are plastics a miracle or a curse? We will explore the differences between natural and synthetic plastics, and how plastic production (and recycling) has changed since the 19th century. We will also evaluate our individual reliance on synthetic plastics - and consider how it is possible that plastics not only help humanity and the environment but also cause significant harm. Finally, we will study how issues associated with plastic use extend well beyond the solid waste stream in landfills to the Great Garbage Patches of the world's oceans. You will have the opportunity to inventory your plastic use and recycling and share your information and thoughts on this subject through various platforms and reflective writing assignments.
Prerequisites: None
Offered: As needed, January Term
UC: Natural Sciences

BIO 224. Water and Human Health. 3 Credits.
Water is a natural resource that is vital for human survival and health, although only a tiny fraction of the Earth's supply is available to humans and terrestrial animals. This course will focus on water as a global resource and global cycle, as well as investigating the past and current threats to this natural resource.
Prerequisites: None
Offered: As needed
UC: Natural Sciences

BIO 225. Physiological Diversity. 3 Credits.
This course provides an analysis of the physical and chemical processes that maintain animal life, including humans. Lectures cover the interdependent function of molecules, cells, organs and tissues as they relate to organismal function and fitness. Physiological principles are examined in a comparative framework and investigated through inquiry-based activities such as case study analyses and the reading of primary literature. Emphasis is on the roles of physiology in the maintenance of homeostasis throughout the life cycle of an animal. Must be taken in conjunction with BIO 225L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 225L.
Offered: Every other year, Fall

BIO 225L. Physiological Diversity Lab. 1 Credit.
Lab to accompany BIO 222 (3 lab hours).This course complements the BIO 225 lecture section by allowing students to investigate physiological principles via experimentation and case study analyses. Must be taken in conjunction with BIO 225.
Corequisites: Take BIO 225.
Offered: Every other year, Fall

BIO 240. Cellular Communication. 3 Credits.
This class focuses on the molecular mechanisms by which cells communicate with each other. Using examples from both prokaryotes and eukaryotes, students examine how cells release signaling molecules and then consider how target cells recognize and respond to the signals. Participants discuss how the basic processes are altered in diseases of signal processing such as cancer, diabetes and depression.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Offered: Every year, Fall

BIO 250. Biology Journal Club. 1 Credit.
BIO 250 is a scientific journal club in which students present published research papers to their peers, providing the background necessary for their peers to understand the experiments and discussing the implications of the science.
Prerequisites: Take BIO 101 and BIO 101L or BIO 101H and BIO 101HL or BIO 103 or BIO 104 and BIO 104L or BIO 150; Minimum grade C-.
Offered: Every year, Fall and Spring

BIO 252. Ecology and Biodiversity. 3 Credits.
Students develop a deeper understanding of central concepts and issues in ecology and biodiversity by building on information and skills acquired in BIO 150 and BIO 151. Specific areas of interest include populations and forces that regulate them, species concepts, and the ecological roles and evolutionary significance of key organisms. Must be taken in conjunction with BIO 252L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 252L;
Offered: Every year, Fall and Spring

BIO 252L. Ecology and Biodiversity Laboratory. 1 Credit.
Lab to accompany BIO 252 (2 lab hours). Selected activities, field experiences and exercises develop skills in observation, documentation, experimental design, data analysis and scientific written and oral communication. Must be taken in conjunction with BIO 252.
Corequisites: TAKE BIO 252;
Offered: Every year, Fall and Spring

BIO 282. Genetics. 3 Credits.
This course considers the basic principles of inheritance, including data analysis and problem-solving skills. Students gain laboratory experience with a variety of techniques and organisms of current research importance, as well as with solving problems and analyzing data. Emphasis is on sound logic, creative thought and experimental design. Must be taken in conjunction with BIO 282L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 282L.
Offered: Every year, Fall
UC: Natural Sciences

BIO 282L. Genetics Lab. 1 Credit.
Lab to accompany BIO 282 (3 lab hours). This course introduces the fundamental principles of classical genetics using model organisms of medical and research relevance. Basic molecular genetic concepts are also introduced Must be taken in conjunction with BIO 282.
Corequisites: Take BIO 282.
Offered: Every year, Fall
UC: Natural Sciences

BIO 298. Research Methods in Biology. 3 Credits.
This introduction to biological research includes discussion and demonstrated skills in library use, literature citation, academic integrity, experimental design and statistical and graphical treatment of data. It culminates in the collaborative design, preparation and presentation of a scientific research project. This course also includes exploration of the skills and values important to careers in science. Primary emphasis is given to the development of scientific literacy, critical thinking and reasoning, and written and oral communication.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Offered: Every year, Fall and Spring

BIO 300. Special Topics. 3-4 Credits.
Special topics in biology.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Offered: As needed

BIO 300L. Special Topics Lab. 1 Credit.
Lab to accompany BIO 300.
Corequisites: Take BIO 300.
Offered: As needed

BIO 317. Developmental Biology. 2 Credits.
This course is an introduction to the basic developmental processes that enable a single cell to differentiate and create entire organ systems. Various animal models are explored, compared and integrated to illustrate key molecular and cellular events that lead to the formation of an entire organism. Must be taken in conjunction with BIO 317L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 317L.
Offered: Every other year, Spring

BIO 317L. Developmental Biology Lab. 2 Credits.
Lab to accompany BIO 317 (3 lab hours). This project-based laboratory uses a variety of different model systems to examine development. Must be taken in conjunction with BIO 317.
Corequisites: Take BIO 317.
Offered: Every other year, Spring

BIO 323. Invertebrate Zoology. 3 Credits.
This course introduces the basic adaptive features of the major invertebrate groups with emphasis on structure, classification, ecology and evolution, utilizing both lab and field studies. Must be taken in conjunction with BIO 323L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 323L.
Offered: Every other year, Spring

BIO 323L. Invertebrate Zoology Lab. 1 Credit.
Lab to accompany BIO 323 (3 lab hours). Must be taken in conjunction with BIO 323.
Corequisites: Take BIO 323.
Offered: Every other year, Spring

BIO 324. Vertebrate Zoology. 3 Credits.
This course examines the origin, diversity, adaptations, and natural history of the main vertebrate lineages: fishes, amphibians, reptiles (including dinosaurs and birds), and mammals. We will consider how environmental changes that have occurred over the billions of years of the Earth's existence have shaped the morphological, physiological, and behavioral features in each vertebrate class. In doing so, students will examine the anatomy and physiology of major body systems, including the skeletal, circulatory, integumentary, urinary, reproductive, respiratory, and nervous systems of vertebrates. Must be taken in conjunction with BIO 324L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 324L
Offered: Every other year, Fall

BIO 324L. Vertebrate Zoology Lab. 1 Credit.
Lab to accompany BIO 324 (3 lab hours). This course complements the lecture course (BIO 324) to examine the origin, diversity, adaptations, and natural history of the main vertebrate lineages: fishes, amphibians, reptiles (including dinosaurs and birds), and mammals. In the laboratory course, students will perform dissections and view specimens to better understand the comparative anatomy and physiology of the major vertebrate groupings. In doing so, students will examine the anatomy and physiology of major body systems, including the skeletal, circulatory, integumentary, urinary, reproductive, respiratory, and nervous systems of vertebrates. Must be taken in conjunction with BIO 324.
Corequisites: Take BIO 324

BIO 325. Environmental Toxicology. 3 Credits.
Environmental Toxicology is an exciting field involving the application of toxicological principles to environmental problems associated with chemical, biological and physical poisons. We begin this course by establishing an understanding of toxin classification (target organ and mechanism of action); uptake, distribution, storage and elimination of toxicants; detoxification, biotransformation and biomagnification; and dose-response relationships. We then use this foundation to discuss biological testing, health and risk assessment, pollutant impact on environmental compartments (air, water, and soil), and remediation. Ultimately, we will investigate the ecotoxicological effects of chemical and physical disease-causing agents on wildlife and human health at the molecular level (biochemical pathways of metabolism and detoxification); the organismal level (target organs, behavioral effects); and the ecosystem level (nutrient cycling and ecosystem services).
Prerequisites: Take BIO 102 or BIO 151, and CHE 211/CHE 211L, or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Offered: As needed

BIO 328. Human Clinical Parasitology. 3 Credits.
This course considers the biology of protozoan and helminth parasites of humans and includes an introduction to tropical medicine. Lectures focus on the life cycles of selected parasites and epidemiology and pathology of selected parasitic diseases. Laboratory work focuses on clinical diagnosis, diagnostic techniques (including immunodiagnostic techniques), recognition of vectors, and experimental life cycle studies using both living and preserved materials. Must be taken in conjunction with BIO 328L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 328L.
Offered: Every other year, Spring

BIO 328L. Human Clinical Parasitology Lab. 1 Credit.
Lab to accompany BIO 328. (3 lab hours.) Must be taken in conjunction with BIO 328.
Corequisites: Take BIO 328.
Offered: Every other year, Spring

BIO 329. Neurobiology. 3 Credits.
This course provides an introduction to molecular, cellular and systems neuroscience. After exploring basic topics including electrical excitability, neurotransmitters and receptors, the course considers higher-level integrated systems such as the sensory systems. Human disorders are discussed to highlight the importance of proper functioning of the various components of the nervous system.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 and take CHE 111 and CHE 111L or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses and CHE 111 CHE 111L. Minimum grade C-.
Offered: Every year, Spring

BIO 346. Cell Physiology. 3 Credits.
This course examines the physiology of the cell with emphasis on the structure and function of the eukaryotic cell. Topics include intracellular transport, cytoskeleton, movement, communication and control of cellular reproduction. The lab involves current techniques for studying proteins, cellular components and living organisms. Must be taken in conjunction with BIO 346L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 346L.
Offered: Every year, Fall

BIO 346L. Cell Physiology Lab. 1 Credit.
Lab to accompany BIO 346 (3 lab hours). This project-based laboratory uses current techniques for separating and studying cellular proteins and components and observing living organisms. The lab culminates with a major project investigating eukaryotic motility and cell structure. (3 lab hrs.) Must be taken in conjunction with BIO 346.
Corequisites: Take BIO 346.
Offered: Every year, Fall

BIO 350. Cardiovascular Physiology. 3 Credits.
The focus of this course is to advance the study of the mammalian heart. This clinically-oriented course examines the structure and function of the heart, electrophysiology, cardiac cycle, cardiac output, blood vessels, hemodynamics and blood pressure. Students participate in "Grand Rounds" presentations while learning about cardiovascular pathologies. May not be taken for credit concurrently with or after completion of BIO 125.
Prerequisites: Take BIO 212 and BIO 212L.
Offered: Every other year, Fall

BIO 352. Botany. 2 Credits.
The biology of plants, focusing on morphology, physiology, growth, genetics, evolution, ecology, ethnobotany and their importance to humans.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 352L.
Offered: As needed

BIO 352L. Botany Lab. 2 Credits.
Lab to accompany BIO 352 (4 lab hours).
Corequisites: Take BIO 352.
Offered: As needed

BIO 356. Aquatic Ecology. 2 Credits.
This introduction to the study of the biology, chemistry, geology and the physics of ponds, lakes and streams includes studies of life histories of representative freshwater organisms. Students receive field training in limnological techniques.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 356L.
Offered: As needed

BIO 356L. Aquatic Ecology Lab. 2 Credits.
Lab to accompany BIO 356 (4 lab hours).
Corequisites: Take BIO 356.
Offered: As needed

BIO 358. Conservation Biology. 2 Credits.
This course examines the effects humans have on the ecosystem and explores how plants and animals have adapted to the changing planet. Students learn how to quantify changes in the ecological communities and begin to explore possible solutions to environmental issues. Completion of BIO 152, BIO 152L is recommended but not required. Must be taken in conjunction with BIO 358L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 358L.
Offered: Every other year, Fall

BIO 358L. Conservation Biology Lab. 2 Credits.
Lab to accompany BIO 358(3 lab hours). This course will explore different ecosystems and practice skills quantifying ecological changes. Students will design and execute their own experiment examining the effects of humans on the ecosystem. Must be taken in conjunction with BIO 358.
Corequisites: Take BIO 358.
Offered: Every other year, Fall

BIO 365. Cancer Biology. 3 Credits.
This course provides an overview of cancer biology. With a focus on the molecular genetics of cancer, the course explores the identification of the genes and biochemical pathways which when disrupted lead to a deregulation of cell growth and differentiation. A discussion of disease pathology includes tumor classification, prognosis and current treatment options.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 and BIO 151L or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Offered: Every other year, Spring

BIO 375. Physiological Models for Human Disease. 3 Credits.
This course investigates cellular and molecular mechanisms of animal physiology using a variety of animal model systems including Drosophila melanogaster (fruit fly), Caenorhabditis elegans (roundworm), Dugesia tigrina (planaria), Danio rerio (zebrafish) and Gallus gallus domesticus (chicken). Students are introduced to current applications of several experimental models for biomedical research on human health and diseases. Must be taken in conjunction with BIO 375L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 375L.
Offered: Every other year, Fall

BIO 375L. Physiological Models for Human Disease Lab. 1 Credit.
Lab to accompany BIO 375 (3 lab hours). Students work in groups to design and carry out experiments using one of four model systems listed Drosophila melanogaster (Fruit Fly), Caenorhabditis elegans (Roundworm), Dugesia tigrina (Planaria) and Danio rerio (Zebrafish). Students analyze experimental data and present findings via oral presentations. Must be taken in conjunction with BIO 375.
Corequisites: Take BIO 375.
Offered: Every other year, Fall

BIO 382. Human Genetics. 3 Credits.
This course examines the genetic mechanism in humans, including data analysis and problem-solving skills. The course includes an exposure to techniques for analysis of genetic variation in humans, the structure of the human genome, the implication of human genetic variation, somatic cell genetics, an introduction to medical genetics, DNA analysis, and the implications of genetic knowledge in the context of modern society and culture. Must be taken in conjunction with BIO 382L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 382L.
Offered: Every other year, Spring

BIO 382L. Human Genetics Lab. 1 Credit.
Lab to accompany BIO 382 (3 lab hours). Must be taken in conjunction with BIO 382.
Corequisites: Take BIO 382.
Offered: Every other year, Spring

BIO 383. Evolution. 3 Credits.
This course examines the mechanisms of evolutionary change and surveys the evolutionary and phylogenetic history of life on earth. Using primary research, students focus on how form, function and life histories of organisms have evolved.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Offered: Every other year, Spring

BIO 385. Explorations in Biology. 1-4 Credits.
In this course, guided individual and group assignments in Blackboard focus on synthesis of foundational knowledge in biology, development of scientific literacy, critical and creative thinking and communication skills and preparation for careers in science as responsible citizens. This course must be completed during the ongoing experiential learning project/experience, which must relate to the biological sciences and occur outside the classroom. The experiential learning project and course credit must be approved by the academic coordinator prior to enrollment.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 and BIO 298 or, for students in the Schools of Nursing or Health Sciences, take at least 10 credits of BIO courses. Minimum grade C-.
Offered: Every year, All

BIO 386. Environmental Studies Practicum. 1-4 Credits.
Environmental issues pose some of the greatest concerns facing our planet. Problems like global warming, acid rain, urban sprawl, air and water pollution, loss of biodiversity and deforestation affect all our communities. Students will study sustainability and environmental science/policy in the US or abroad, in an immersive experience where they will meet and learn from individuals from across the country and around the world. Students will explore humanity's complex relationship with the environment and will deepen their knowledge of distinct cultures and environmental issues while arming themselves with tools for tackling unique challenges in various environments.
Prerequisites: None
Offered: As needed

BIO 399H. Honors Research in Biological Sciences. 3 Credits.
This course is designed for biology majors seeking departmental honors and for university honors students majoring in science or health science-related programs. In this capstone seminar, students participate in in-depth examination of primary research papers. The material relates to a central theme chosen by the instructor.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 and BIO 298. Minimum grade C-.
Offered: As needed

BIO 471. Molecular Genetics. 3 Credits.
This course introduces students to the fundamental concepts of molecular biology, with a focus on DNA and RNA structure and function, facilitating an understanding of the molecular underpinnings of genetics and inheritance. The theory and practice of DNA manipulation, which is critical for various medical and research purposes will also be explored. This course aims to serve students interested in careers in medicine, biotechnology, microbiology and graduate programs. Must be taken in conjunction with BIO 471L.
Prerequisites: Take BIO 102 and BIO 102L or BIO 102H and BIO 102HL or BIO 151 and CHE 110 or CHE 111, or for students in the Schools of Nursing or Health Sciences, take at least 7 credits of BIO courses. Minimum grade C-.
Corequisites: Take BIO 471L.
Offered: Every other year, Spring

BIO 471L. Molecular Genetics Lab. 1 Credit.
Lab to accompany BIO 471 (3 lab hours). Provides students with hands on experience using fundamental techniques of importance within the fields of molecular genetics and molecular biology. Must be taken in conjunction with BIO 471.
Corequisites: Take BIO 471.
Offered: Every other year, Spring

BIO 491. Independent Research in Biological Science. 1 Credit.
Students participate in original independent research under the guidance of a full-time Quinnipiac faculty member in the Department of Biological Sciences. The student is required to submit for approval an independent research proposal describing the research to be conducted; students may not self-register for this one credit course. Students may take a total of 8 credits of Independent Research through enrollment in BIO 491, BIO 492, BIO 493, BIO 494.
Prerequisites: None
Offered: Every year, All

BIO 491H. Independent Research in Biological Science Honors. 1 Credit.
University or departmental honors students participate in original independent research under the guidance of a full-time Quinnipiac faculty member in the Department of Biological Sciences. The student is required to submit for approval an independent research proposal describing the research to be conducted; students may not self-register for this one-credit course. Students may take a total of 8 credits of Independent Research through enrollment in BIO 491, BIO 491H, BIO 492, BIO 492H, BIO 493, BIO 493H, BIO 494, or BIO 494H.
Prerequisites: None
Offered: Every year, All

BIO 492. Independent Research in Biological Sciences. 2 Credits.
Students participate in original independent research under the guidance of a full-time Quinnipiac faculty member in the Department of Biological Sciences. The student is required to submit for approval an independent research proposal describing the research to be conducted; students may not self-register for this two credit course. Students may take a total of 8 credits of Independent Research through enrollment in BIO 491, BIO 492, BIO 493, BIO 494.
Prerequisites: None
Offered: Every year, All

BIO 492H. Independent Research in Biological Sciences Honors. 2 Credits.
Students participate in original independent research under the guidance of a full-time Quinnipiac faculty member in the Department of Biological Sciences. The student is required to submit for approval an independent research proposal describing the research to be conducted; students may not self-register for this two credit course. Students may take a total of 8 credits of Independent Research through enrollment in BIO 491, BIO 492, BIO 493, BIO 494.
Prerequisites: None
Offered: Every year, All

BIO 493. Independent Research in Biological Sciences. 3 Credits.
Students participate in original independent research under the guidance of a full-time Quinnipiac faculty member in the Department of Biological Sciences. The student is required to submit for approval an independent research proposal describing the research to be conducted; students may not self-register for this three credit course. Students may take a total of 8 credits of Independent Research through enrollment in BIO 491, BIO 491H, BIO 492, BIO 492H, BIO 493, BIO 493H, BIO 494, or BIO 494H.
Prerequisites: None
Offered: Every year, All

BIO 493H. Independent Research in Biological Sciences. 3 Credits.
Students participate in original independent research under the guidance of a full-time Quinnipiac faculty member in the Department of Biological Sciences. The student is required to submit for approval an independent research proposal describing the research to be conducted; students may not self-register for this three credit course. Students may take a total of 8 credits of Independent Research through enrollment in BIO 491, BIO 491H, BIO 492, BIO 492H, BIO 493, BIO 493H, BIO 494, or BIO 494H.
Prerequisites: None
Offered: Every year, All

BIO 494. Independent Research in Biological Sciences. 4 Credits.
Students participate in original independent research under the guidance of a full-time Quinnipiac faculty member in the Department of Biological Sciences. The student is required to submit for approval an independent research proposal describing the research to be conducted; students may not self-register for this four credit course. Students may take atotal of 8 credits of Independent Research through enrollment in BIO 491, BIO 491H, BIO 492, BIO 492H, BIO 493, BIO 493H, BIO 494, or BIO 494H.
Prerequisites: None
Offered: Every year, All

BIO 494H. Independent Research in Biological Sciences. 4 Credits.
Students participate in original independent research under the guidance of a full-time Quinnipiac faculty member in the Department of Biological Sciences. The student is required to submit for approval an independent research proposal describing the research to be conducted; students may not self-register for this four credit course. Students may take atotal of 8 credits of Independent Research through enrollment in BIO 491, BIO 491H, BIO 492, BIO 492H, BIO 493, BIO 493H, BIO 494, or BIO 494H.
Prerequisites: None
Offered: Every year, All