

BIOLOGY (BIO)

BIO 100 Fundamentals of Biology (GL) (4 credits)

In this introductory course for nonscience majors, a general survey of the characteristics of life is presented, including such topics as cellular biology, metabolism, organ systems, genetics, development, evolution, behavior and ecology. A brief examination of both the plant and animal kingdoms is presented. NOTE: BIO 100 will not satisfy the science requirement for science majors. The course meets for a total of 90 contact hours per semester. Course fee.

BIO 107 General Zoology (4 credits)

This introduction to the animal kingdom includes a survey of the taxonomy, morphology, anatomy and physiology of animals using selected organisms. Primary laboratory emphasis is concerned with physiological processes, survey of phyla and field studies. The course meets for a total of 30 lecture hours and 60 laboratory hours per semester. Course fee.

Prerequisite(s): BIO 120

BIO 108 Human Body in Health and Disease (GS) (3 credits)

Designed for nonscience majors, this course includes a survey of the structure and function of human body systems and the disorders in those systems which result from disease processes.

BIO 109 Human Genetics (GS) (3 credits)

This is an introductory genetics course for nonscience majors emphasizing the fundamental genetic concepts and how they affect humans. Topics such as genetic engineering, genetic diseases and gene repair are discussed. NOTE: Course requires high school biology.

BIO 110 Introduction to Plant Sciences (GL) (4 credits)

This course investigates the fundamentals of plant science. Included topics are plant anatomy and physiology, classification, genetics, ecology, and the importance of plants to society. Students conduct laboratory investigations, observe local plant communities, examine the relationships between plants and animals and evaluate the relationships between soil and plant health. The course meets for a total of 45 lecture and 45 laboratory hours per semester. Course fee. Field trips may be required.

BIO 116 Human Body in Health and Disease Laboratory (GL) (1 credit)

This laboratory course provides hands-on learning using dissection, physiology exercises, models and slides, science technology, computer activities, and experimentation to reinforce the concepts in BIO 108, Human Body in Health and Disease. The course meets for a total of 30 laboratory hours per semester. This course has a fee.

Prerequisite(s): BIO 108 (may be taken concurrently)

BIO 119 Biology for Health Professionals (GL) (4 credits)

This course is intended for students who plan to enroll in BIO 203, Anatomy and Physiology I. This course is not for biology majors. This course examines fundamental principles in general, organic, nuclear and biochemistry, cell biology, metabolism, development, molecular biology, epigenetics, biotechnology, and inheritance. The application of these topics in the health science field is stressed. The development of academic and reasoning skills required for the study of the sciences are emphasized throughout the course. Three lecture hours and three laboratory hours per week. COURSE NOTE: Eligibility for this course requires a grade of C or higher in high school chemistry and a qualifying score on the reading assessment or the following Course fee.

Prerequisite(s): (Accuplacer Reading with a score of 079 and) or (Accuplacer Reading with a score of 079 and CHEM 010) or (ENG 003 and) or (ENG 003 and CHEM 010) or (ENG 018 and) or (ENG 018 and CHEM 010) or (SAT Verbal/Critical Reading with a score of 480 and) or (SAT Verbal/Critical Reading with a score of 480 and CHEM 010) or (Accuplacer Rdg (invalid) with a score of 079 and) or (Accuplacer Rdg (invalid) with a score of 079 and CHEM 010) or (PARCC English Language with a score of 750) or (Next Gen Reading with a score of 263)

BIO 120 General Biology I (GL) (4 credits)

An introduction to biology (cellular/molecular) for the science major. Basic biological principles common to plants and animals, cell structure and function, biochemical processes, heredity, cell reproduction, and gene expression are presented. Laboratory emphasizes open-ended experimental methods of inquiry. The course meets for 45 lecture/discussion hours and 45 laboratory hours per semester. COURSE NOTE: Eligibility for this course requires high school chemistry or CHEM 010. Course fee.

Prerequisite(s): CHEM 010 or (CHEM 111)

BIO 121 General Biology II (GL) (4 credits)

An introduction to biology (organismic/evolutionary) for the science major. This course emphasizes basic biological principles of evolution, ecology, and behavior. Laboratory emphasizes open-ended experimental methods of inquiry and field studies. The course meets for 45 lecture/discussion hours and 45 laboratory hours per semester. Eligibility includes high school chemistry or CHEM 010 and BIO 120 or BIO 100. This course has a fee. Course fee.

Prerequisite(s): (CHEM 010 or) and (BIO 120 or BIO 100)

BIO 128 Introduction to Biotechnology (4 credits)

This course introduces students to the concepts and techniques of biotechnology, including overviews of the development of biotechnology; career fields; current techniques and applications; and bioethics and responsible conduct of research. Students will conduct self-directed research in areas such as microbiology, virology, and molecular biology. The course meets for 45 lecture/discussion hours and 45 laboratory hours per semester. Requires a grade of C or better in high school chemistry or CHEM 010 or CHEM 111. BIO 120 may be taken prior to or at the same time as BIO 128. Offered only in the fall semester. Course fee.

Prerequisite(s): (CHEM 010) or (CHEM 111) and (BIO 120 (may be taken concurrently))

BIO 191 Independent Study: Biology (1 credit)

BIO 192 Independent Study: Biology (2 credits)

BIO 193 Independent Study: Biology (3 credits)

BIO 203 Anatomy and Physiology I (GL) (4 credits)

This course provides a comprehensive study of the structure and function of the human body. The course focuses on the histology, gross anatomy and physiology of the integumentary, skeletal, muscular, nervous (including special senses), and endocrine systems. Emphasis is placed on the anatomy of the organ systems and the maintenance of homeostasis for optimal functioning of the human organism. The course includes a total of 45 hours of lecture and 45 hours of laboratory. COURSE NOTE: this course requires a grade of "C" or better in either BIO 119, or BIO 120, or a minimum score of 70% on the Biology for Allied Health Assessment exam, or upon permission of instructor. Course fee.

Prerequisite(s): (Biology for Allied Health with a score of 070) or (BIO 099) or (BIO 119) or (BIO 120)

BIO 204 Anatomy and Physiology II (GL) (4 credits)

This course provides a comprehensive study of the structure and function of the human body. The course focuses on the histology, gross anatomy and physiology of the cardiovascular, immune, respiratory, digestive, urinary and reproductive systems. It also provides students with an understanding of the crucial functions of energetics, thermoregulations, fluid, electrolyte and acid-base balance. Emphasis is placed on the physiology of the organ systems and the maintenance of homeostasis for optimal functioning of the human organism. The course includes a total of 45 hours of lecture and 45 hours of laboratory time. COURSE NOTE: this course requires a grade of C or better in BIO 103 or BIO 203. Course fee.

Prerequisite(s): (BIO 103) or (BIO 203)

BIO 205 Microbiology (GL) (4 credits)

This course is for students requiring a college level microbiology course. The general characteristics of microorganisms are presented emphasizing microbial morphology and physiology, infectious disease, and methods of control. The laboratory emphasizes microbiology techniques. The course includes a total of 45 hours of lecture and 45 hours of laboratory. Requires a grade of "C" or higher in BIO 119, 120, or 203, or permission of instructor. This course has a fee.

Prerequisite(s): BIO 103 or (BIO 120) or (BIO 119) or (BIO 203)

BIO 208 Genetics (4 credits)

This course presents the principles of inheritance in prokaryotic and eukaryotic organisms and the application of these principles to contemporary issues. Major topics include Mendelian inheritance, gene mapping, molecular genetics, regulation of gene expression, population genetics, and the applications of genetics in biotechnology. Upon completion, students demonstrate a broad understanding of genetics and the principles of heredity. Course meets for 45 hours of lecture and 45 hours of laboratory per semester. Usually offered in the fall semester. Course fee.

Prerequisite(s): (BIO 119 and MATH 026 or MATH 101 or MATH 109 or MATH 103 or MATH 203) or (BIO 119 and Accuplacer College Math with a score of 045) or (BIO 120 and Accuplacer College Math with a score of 045) or (BIO 120 and MATH 026 or MATH 101 or MATH 109 or MATH 103 or MATH 203) or (Next Gen QAS with a score of 263) or (PARCC Algebra II with a score of 750) or (SAT Mathematics with a score of 530 and BIO 119) or (SAT Mathematics with a score of 530 and BIO 120) or (and BIO 119) or (and BIO 120)

BIO 210 Nutrition (GS) (3 credits)

This course is a basic nutrition course for biology or nursing students or those in related health fields. The functions of the nutrients, their utilization throughout the various stages of life, and the effects of nutrient excesses and deficiencies are studied. Current nutritional topics are discussed, including food fallacies, weight control, and cultural, social and psychological influences on food habits.

Prerequisite(s): (BIO 100) or (BIO 103) or (BIO 108) or (BIO 119) or (BIO 120) or (BIO 203)

BIO 211 Microbial Biotechnology (4 credits)

This course introduces students to microbial biotechnology, the use of microbes to generate useful products or degrade wastes. The course includes an overview of the structure, function, genetics, growth requirements, and replication of microbes (bacteria, fungi, and viruses) and their applications in biotechnology. Students will conduct self-directed research in areas including microbiology, virology, and bioinformatics. The course meets for 45 lecture/discussion hours and 45 laboratory hours per semester. Students cannot earn credit in both BIO 205 and BIO 211. Offered only in the spring semester. Course fee.

Prerequisite(s): (BIO 120 and BIO 128)

BIO 212 Principles of Biomanufacturing (4 credits)

Discoveries in biotechnology and pharmaceutical companies are being used to manufacture new products for the improvement of health and the diagnosis and treatment of disease. This course introduces students to the biomanufacturing process of biopharmaceuticals, including producing them under Current Good Manufacturing Practices. Students will learn about and practice in laboratory the tools of manufacturing, such as upstream and downstream procedures, as well as safety, quality control, quality assurance, and compliance with local, state, federal, and international biotechnology regulations. The course meets for 45 lecture/discussion hours and 45 laboratory hours per semester. Offered only in the fall semester. Course fee.

Prerequisite(s): (BIO 120 and BIO 128)

BIO 213 Cell Culture Techniques (4 credits)

This course introduces students to the theory and applications of cell culture techniques. Topics in this course include aseptic techniques, media preparation, cell counting and dilution, maintenance and propagation of cell lines, contamination, and the application of various molecular techniques to manipulate and assess cell function in vitro. The course meets for 45 lecture/discussion hours and 45 laboratory hours per semester. Offered only in the fall semester. Course fee.

Prerequisite(s): BIO 120

BIO 214 Molecular Techniques (4 credits)

This is a research-based course in the theory and methods of molecular techniques used in the study of nucleic acids. This course will emphasize scientific written communication. Lecture topics include nucleic acid isolation and analysis, recombinant DNA cloning, primer design, endpoint and real time PCR, regulation of prokaryotic and eukaryotic gene expression, enzymes used in molecular biology, and synthetic biology. The lab is designed as a Course-Based Undergraduate Research Experience (CURE) for biotechnology students to learn and engage with synthetic biology concepts and practices. Students will design and conduct their own synthetic biology experiments with instructor support. Offered only in the spring semester. This course has a fee. Course fee.

Prerequisite(s): BIO 120

BIO 215 Immunology Principles and Applications (4 credits)

This course introduces students to the structural and functional aspects of the immune system and their applications in biotechnology. The course includes an overview of innate and adaptive immunity, B and T cell development and function, antigen and antibody structure and interactions, cytokines, MHC complexes, and complement. Lecture and lab will focus on immunological and protein methods used in biotechnology, including protein purification and characterization techniques, SDS-PAGE, Western blots, and ELISA. The course meets for 45 lecture/discussion hours and 45 laboratory hours per semester. Prerequisites : BIO 120 General Biology I. Offered only in the spring semester. Course fee.

Prerequisite(s): BIO 120

BIO 271 Cooperative Education I: Biology (1 credit)

Cooperative Education experiences are work-based learning experiences with an employer for a specific period of time. The experience may be paid and must be related to the career and specific curriculum in which the student is enrolled. It is an opportunity for the student to supplement/integrate classroom learning with learning from a related work setting. A student registers for one to four credits of Cooperative Education in the curriculum in which he/she is enrolled. Students must have completed 12 credits prior to co-op, and have a GPA of 2.0 or higher. Please see the Coordinator for Career Services in Advising, Career & Transfer Services for approval. Requires approval of program coordinator.

BIO 272 Cooperative Education II: Biology (2 credits)

Cooperative Education experiences are work-based learning experiences with an employer for a specific period of time. The experience may be paid and must be related to the career and specific curriculum in which the student is enrolled. It is an opportunity for the student to supplement/integrate classroom learning with learning from a related work setting. A student registers for one to four credits of Cooperative Education in the curriculum in which he/she is enrolled. Students must have completed 12 credits prior to co-op, and have a GPA of 2.0 or higher. Please see the Coordinator for Career Services in Advising, Career & Transfer Services for approval.

BIO 273 Cooperative Education III: Biology (3 credits)

Cooperative Education experiences are work-based learning experiences with an employer for a specific period of time. The experience may be paid and must be related to the career and specific curriculum in which the student is enrolled. It is an opportunity for the student to supplement/integrate classroom learning with learning from a related work setting. A student registers for one to four credits of Cooperative Education in the curriculum in which he/she is enrolled. Students must have completed 12 credits prior to co-op, and have a GPA of 2.0 or higher. Please see the Coordinator for Career Services in Advising, Career & Transfer Services for approval.

BIO 274 Cooperative Education IV Biology (4 credits)