

BIOLOGY - BLOOMFIELD COLLEGE (BIO)

BIO 111 General Biology: Cell (4 credits)

Corequisite(s): BIO 111L. This course is one of two introductory general biology courses. Topics include the origin of life, the cellular level of organization, the chemical/physical basis of life, genetics, and the molecular biology of gene expression. Satisfied SEEDS Scientific Reasoning student learning outcome in alignment with Educated Citizenry value.

BIO 111L Lab - BIO 111 (0 credits)

BIO 115 Selected Topics in Biology (1-3 credits)

This course presents selected topics in biology. Topics may include evolution, biomechanics (e.g. flight), emerging diseases (e.g. AIDS, Ebola virus), history of biological science, antibiotic resistant pathogens, cancer, nutrition, biotechnology and human affairs, etc. As topics change, this course may be repeated for credit. Science majors may not enroll in this course without the consent of the Instructor.

BIO 121 General Biology: Diversity (4 credits)

Corequisite(s): BIO 121L. This course is one of two introductory general biology courses. Topics will include the evolution, diversity, development, reproduction, physiology, ecology, and behavior of living organisms. Laboratory work will include naturalistic observation as well as experimentation and will emphasize the analysis, organization, and presentation of data.

BIO 121L Lab - BIO 121 (0 credits)

BIO 200 Microbiology (4 credits)

Corequisite(s): BIO 200L. This course describes the structure, physiology and culture of bacteria and related organisms, their importance in nature and their relationship to human problems of food preservation, sanitation, disease, and immunity.

BIO 200L Lab - BIO 200 (0 credits)

BIO 205 Human Anatomy and Physiology I (4 credits)

Corequisite(s): BIO 205L. Prerequisite(s): High School Biology. This course is a study of the organization of the human body, and the anatomy and physiology of the skeletal, muscular, and circulatory (heart and circulation) systems. It is the first part of a two part sequence. The laboratory experience will include study of mammalian anatomy.

BIO 205L Lab - BIO 205 (0 credits)

BIO 206 Human Anatomy and Physiology II (4 credits)

Corequisite(s): BIO 206L. Prerequisite(s): BIO 205 or BIO 121. This course is a study of the structure and physiology of the human circulatory (hematology), respiratory, nervous, "special senses," digestive, urinary, endocrine, reproductive, and integumentary systems. General information on cells and tissues will be presented. It is the second part of a two-part sequence. The laboratory experience will include experiments in physiology.

BIO 206L Lab - BIO 206 (0 credits)

BIO 211 The Biology of Human Growth and Aging (3 credits)

This course introduces non-biology majors to human biology through the lens of growth, development, and aging. Students explore how major organ systems develop, function, and change from birth through senescence, and how humans maintain health and homeostasis in response to environmental and lifestyle changes. Through integrated laboratory experiences, students apply the scientific method to investigate human anatomy, physiology, reproduction, and heredity. This course prepares students to make informed, evidence-based decisions about personal health, reproduction, and wellbeing across different stages of life.

BIO 213 Molecular and Cellular Biology (4 credits)

Corequisite(s): BIO 213L. Prerequisite(s): BIO 111 or BIO 200. This course is an in-depth treatment of nucleic acid metabolism and cellular architecture. The lecture emphasizes the relationships between structure and function at the cellular level, while the laboratory component highlights recent developments in recombinant DNA technology.

BIO 213L Lab - BIO 213 (0 credits)

BIO 309 Genetics (4 credits)

Corequisite(s): BIO 309L. Prerequisite(s): BIO 213 and MTH 200. This course introduces the student to the fundamental principles of mendelian, population, and molecular genetics. The biochemistry of genetic material, the physical basis of inheritance as well as the mode of expression of genetic material in individuals and populations will be covered. Laboratory experiments with statistics will demonstrate the principle of molecular, mendelian, and population genetics. Recitation included.

BIO 309L Lab - BIO 309 (0 credits)

BIO 317 Immunology (4 credits)

Prerequisite: BIO 213. This course is an introduction to the rapidly expanding field of immunology covering such topics as the immune response, (cellular and humoral) immunoglobulins, antigen-antibody reactions, immunohematology complement and cytotoxicity, immunopathology (hypersensitivity and autoimmune diseases), transplantation and oncoimmunology.

BIO 320 Ecology (4 credits)

Corequisite(s): BIO 320L. Prerequisite(s): BIO 111 or BIO 121; and MTH 200. This course is a study of the relationships between animals and plants and their environment. Population growth and species interactions, organization of biological communities, ecosystem structure and function (energy flow and biogeochemical cycles) will be discussed. Current examples ("case studies") of environmental problems will be examined to show the real application of basic ecological principles. Laboratory consists of experimental and descriptive laboratories with experience in field techniques.

BIO 320L Lab - BIO 320 (0 credits)

BIO 401 Biochemistry I (3 credits)

Prerequisite(s): CHM 301; CHM 302, CHM 303, and CHM 304 are strongly recommended. The course presents proteins, lipids, and carbohydrates from the perspective of organic functional group chemistry, physical chemistry, analytical chemistry, and biochemistry. The acid-base properties, kinetics, thermodynamics and reactions of these biomolecules will be covered. Structure correlated to function will be an integral component of the discussion. The course consists of lecture and recitation. Mutually Exclusive with CHM 401.

BIO 402 Biochemistry II (3 credits)

Prerequisite(s): BIO 213. This course covers the biochemistry of the nucleic acids and proteins. Topics include DNA replication, transcription, translation, gene regulation, and protein function. The overall regulation of metabolic pathways will also be addressed. Mutually Exclusive with CHM 402.

BIO 404 BIOCHEMISTRY I LAB (2 credits)

Corequisite(s): BIO 401 or CHM 401. Prerequisite(s): CHM 303. The course considers the qualitative and quantitative aspects of protein, lipid, and carbohydrate analyses. The laboratory includes applications of wet chemistry, as well as analytical techniques such as chromatography [column, thin layer, paper, and high performance liquid chromatography (HPLC)], colorimetric and spectrophotometric analyses, polarimetry, titrimetry and statistical data analysis. Writing Intensive. Mutually Exclusive with CHM 404.

BIO 405 Biochemistry II - Lab (2 credits)

Prerequisite(s): BIO 213. The course covers basic techniques for the extraction, purification, and characterization of DNA, RNA, and protein molecules. (Also CHM 405)

BIO 430 Advanced Selected Topics in Biology (1-4 credits)

Prerequisite(s): Any 200-level Biology course, or permission of the instructor. Restriction(s): Junior or Senior class standing required. Advanced study of specialized topics in the biological sciences, emphasizing emerging areas of research and contemporary biological issues. Topics may include molecular biology, ecology, evolution, physiology, or interdisciplinary applications. Course activities focus on critical analysis, synthesis, and communication of biological concepts and primary scientific literature appropriate to the selected topic, and may include discussion, presentations, and/or research-based projects. The specific topic and credit value will be announced when offered; credit value reflects the scope of content and instructional format, and expected student workload. A minimum of 3 credits is required for this course to count as a biology elective; students should consult with a faculty advisor regarding application toward degree requirements. This course may be repeated for a maximum of 12 credits when topics differ.

BIO 450 Bioseminar (4 credits)

Prerequisite(s): WRT 107, WRT 108, or WRT 109; and five Biology courses. Restriction(s): Biology major with Junior or Senior level standing. The seminar is designed to bring upperclassmen in all biology concentrations together so that they can discuss the major principles of this discipline. The preparation of a literature research paper and its oral presentation develop the ability to critically assess the research literature, expose students to subject areas not encountered in previous courses, develop communication skills, and serve as a basis for continued learning in individual students' particular areas of interest.

BIO 460 Bioresearch (1-4 credits)

Prerequisite(s): Three biology courses at the 200 level or above, and permission of the supervising faculty member; additional prerequisites may be specified based on the research area. Restriction(s): Junior or Senior class standing required. This course is an opportunity for advanced students to design and conduct experimental research under faculty mentorship. Students will learn techniques involved in carrying out a research project, including: literature search, experimental design and implementation, data collection and analysis, and presentation of results. Culminates in a written research report and oral presentation. May be repeated for credit. Minimum 3 credits required to count as a biology elective; course may fulfill only one biology elective requirement regardless of repetitions.