

BIO. BIOLOGY

BIO-406. INVERTEBRATE BIOLOGY

Credits: 4

A study of the major invertebrate phyla with respect to their taxonomy, evolution, morphology, physiology and ecology. Lecture, three hours a week, laboratory, three hours a week. Laboratory fee: \$120. Offered in alternate years.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-411. COMPARATIVE PHYSIOLOGY

Credits: 4

Comparative physiology encompasses the study of organ functions and organ system functions in different animal groups. Emphasis will be on the systemic physiology of vertebrate animals. Lecture, three hours a week; laboratory, three hours a week. Laboratory fee: \$120. Offered in alternate years.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-412. PARASITOLOGY

Credits: 4

Parasitology is the study of organisms that live on or within other organisms and the relationship of these organisms to their hosts. This course deals with the common parasites that infect humans and other animals. Lecture, three hours a week; laboratory, three hours a week. Laboratory fee: \$120. Offered in alternate years.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-414. COMPARATIVE VERTEBRATE ANATOMY

Credits: 4

This course deals with the evolution and anatomy of the organ systems of vertebrates. Lectures survey the comparative anatomy of the vertebrate classes. Laboratory dissections include the Lamprey, Shark, Mud Puppy, and Cat in detail. Lecture three hours per week, laboratory three hours per week. Laboratory fee: \$120. Offered in alternate years.

Pre-Requisites

Biology 121-122.

BIO-421. MAMMALIAN PHYSIOLOGY

Credits: 4

This course examines the function of mammalian systems with regard to homeostasis, metabolism, growth and reproduction. Normal physiological processes as well as some pathophysiological situations are covered. The emphasis is on human physiology; however, other mammalian systems are discussed to demonstrate physiological adaptability to various environmental situations. Laboratory exercises include physiological experimentation in living systems and in computer simulations. Lecture: three hours; Laboratory: three hours. Laboratory fee: \$120. Offered in alternate years.

Pre-Requisites

Biology 121-122, 226, or permission of instructor.

BIO-423. FUNCTIONAL HISTOLOGY

Credits: 4

This course emphasizes the microscopic examination of mammalian tissues from morphological and physiological perspectives. Reference is made to organ embryogenesis to support the understanding of organ form and function. Tissue preparation for histological examination is demonstrated. Lecture, three hours; laboratory, three hours per week. Laboratory fee: \$120. Offered in alternate years.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-425. ENDOCRINOLOGY

Credits: 4

Fees: \$120

This course focuses on the structure, biochemistry, and function of mammalian hormones and endocrine glands; avian, amphibian and invertebrate hormones are also discussed, where relevant. Clinical pathologies resulting from excess or insufficient hormones are discussed, as this is essential to mastering an understanding of endocrinology. Laboratory exercises include experimentation in living systems and computer simulations. Lecture: three hours per week; Laboratory, three hours per week. Laboratory Fee \$120.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-426. IMMUNOLOGY AND IMMUNOCHEMISTRY

Credits: 4

This course is concerned with the biological mechanisms and chemistry of reactants and mediators associated with natural and acquired states of immunity, tissue and blood serum responses to infection and immunization, and related patho-physiologic alterations of hypersensitivity phenomena in vertebrate animals and man. A background in microbiology, physiology, and biochemistry is advisable. Lecture, three hours a week; laboratory three hours a week. Laboratory fee: \$120. Offered in alternate years.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-427. MEDICAL MICROBIOLOGY

Credits: 4

Medical Microbiology provides a professional-level introduction to microbiology that is focused on application of microbiology to the study of infectious disease etiology and epidemiology. The laboratory covers techniques used in isolation and identification of microorganisms. Lecture: three hours a week; Laboratory: three hours per week. Laboratory fee: \$120.

Pre-Requisites

Biology 121-122, Chemistry 231-232.

Biology

BIO-428. DEVELOPMENTAL BIOLOGY

Credits: 4

A course dealing with the principles of animal development from descriptive, experimental, and evolutionary perspectives. Laboratory work includes both descriptive and experimental embryology as well as more molecular techniques. Lecture, three hours; laboratory, three hours a week. Laboratory fee: \$120. Offered in alternate years.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-429. VIROLOGY

Credits: 3

Virology provides an introduction to the biology of animal viruses. Description of viral molecular architecture and genome organization is followed by a survey of strategies employed for multiplication and regulation of gene expression. Pathogenesis of viral infections is considered from perspectives of viral reproduction strategies and host defense.

Pre-Requisites

Biology 121-122, 225-226; Chemistry 231-232, 233-234.

BIO-438. BIOLOGY OF CANCER

Credits: 3

This lecture course explores the various concepts and mechanisms associated with the origins, elaborations and future developments in cellular transformation and carcinogenesis. Emphasis is placed on the molecular biology and physiology of these processes; therefore, a solid background in basic biology is required. Oncogenes, tumor suppressor genes and the disruption of homeostasis are covered in detail, while the medical phenomena typically receive a more general level of coverage.

Pre-Requisites

Biology 121-122, 226; [[CHM-231]]-232.

BIO-441. FRESHWATER ECOSYSTEMS

Credits: 3

A study of the chemical, physical, and biological aspects of freshwater systems. Laboratory investigations consist of in-depth analysis of local lakes and streams. Lecture, two hours a week; laboratory three hours a week. Laboratory fee: \$120. Offered in alternate years.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-443. MARINE ECOLOGY

Credits: 3

An examination of the biology of marine life within the context of modern ecological principles. The structure and physiology of marine organisms are studied from the perspectives of adaptation to the ocean as habitat, biological productivity, and interspecific relationships. Emphasis is placed on life in intertidal zones, estuaries, surface waters, and the deep sea. Two hours of lecture and three hours of laboratory per week. Laboratory fee: \$120. Offered in alternate years.

Pre-Requisites

Biology 121-122, EES 230, or permission of instructor.

BIO-444. ECOLOGY

Credits: 4

Ecology examines contemporary ecological thinking as it pertains to the interrelationship of organisms and their environments. Interactions at the population and community levels are emphasized. Lecture, three hours a week; laboratory, three hours a week. Laboratory fee: \$90. Offered in alternate years.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-445. GENETICS

Credits: 4

Genetics presents treatment of genetics beyond the introductory level with particular emphasis on population and molecular aspects of heredity. Topics include plant and human genetics. Lecture, three hours a week; laboratory, three hours a week. Laboratory fee: \$120. Offered every fall.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-446. ANIMAL BEHAVIOR

Credits: 4

This course emphasizes behavior as the response of animals to physical and social environmental change, and covers the processes that determine when changes in behavior occur and what form they take. Laboratories, using living local fauna, demonstrate principles discussed in lecture. Lecture, three hours; laboratory, three hours a week. Laboratory fee: \$120. Offered in alternate years.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-461. PLANT FORM AND FUNCTION

Credits: 4

An introduction to the morphology, anatomy, cytology, and physiology of plants, with emphasis on the vascular plants. Structural and functional aspects of plants are interpreted in relation to each other and within ecological and evolutionary contexts. Offered in a workshop format of two three-hour sessions per week. Laboratory fee: \$120. Offered every other fall.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-462. PLANT DIVERSITY

Credits: 4

A comprehensive survey of bryophytes, vascular plants and plantlike organisms (fungi and algae) emphasizing their structure, reproductive biology, natural history, evolution, and importance to humans. Offered in a workshop format of two three-hour sessions per week. Laboratory fee: \$120. Offered every other fall.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.

BIO-466. FIELD BOTANY**Credits:** 3

A specialized summertime field course that emphasizes a taxonomic, phylogenetic, and ecological survey of higher plants indigenous to Northeastern Pennsylvania. Meets three days per week during five-week summer session. Two hours of lecture and three hours of lab per day.

Pre-Requisites

Biology 121-122, or permission of instructor. Offered in alternate years.

BIO-468. MEDICAL BOTANY**Credits:** 3

A specialized course that provides a scientifically based overview of the ways that plants affect human health. Topics include cultural and historical perspectives of plants and medicine, plants that cause human ailments, plants that treat human ailments, and psychoactive plants. Lecture, two hours per day for five weeks in alternate summers.

Pre-Requisites

Biology 121-122, 225, [[CHM-232]], or permission of instructor.

BIO-469. PLANT PHYSIOLOGY**BIO-498. TOPICS****Credits:** variable

A study of topics of special interest not extensively treated in regularly offered courses.

Pre-Requisites

Biology 121-122, 225-226, or permission of instructor.