

COURSE INFORMATION (GRADUATE)

BIOLOGY COURSES

BI-419G BIOCHEMISTRY

SPRING ONLY/ALL YEARS

3 credit hours

This course covers the principles of protein chemistry and enzyme nomenclature, catalysis, kinetics and control. It includes three hours of lecture weekly. The lab, BI/CH419L, MUST be taken concurrently. Prerequisites: CH310a, CH311, CH310b and CH312; or concurrent enrollment. Corequisite: BI/CH419L. STUDENTS ARE NOT PERMITTED TO ENROLL IN 300- OR 400- LEVEL COURSES UNTIL THEY HAVE COMPLETED EN111 WITH A GRADE OF "C" OR BETTER AND MA085 LEVEL II OR MA084B OR ANY HIGHER-LEVEL MATH COURSE.

BI-419G/L BIOCHEMISTRY LABORATORY

SPRING ONLY/ALL YEARS

1 credit hour

This course is the laboratory portion of BI/CH419G and MUST be taken concurrently. The course consists of one three-hour laboratory period per week. Prerequisites: CH310a, CH311, CH310b and CH312 or concurrent enrollment. Corequisite: BI/CH419G. Lab Fee: \$32.00. STUDENTS ARE NOT PERMITTED TO ENROLL IN 300- OR 400- LEVEL COURSES UNTIL THEY HAVE COMPLETED EN111 WITH A GRADE OF "C" OR BETTER AND MA085 LEVEL II OR MA084B OR ANY HIGHER-LEVEL MATH COURSE.

BI-425G MOLECULAR MEDICINE

SPRING ONLY/AS REQUIRED

3 credit hours

This course is designed for students who are planning on entering graduate and professional programs in the biological and medical sciences or careers in the biotechnology industry. This course highlights current concepts and trends in molecular biology as well as the latest developments in novel molecular approaches for detection and treatment of diseases. Selected topics in Immunology, Cardiovascular Biology, Tumor Viruses and Cancer Biology, Viral Pathogenesis, and Neurobiology are the focus of this course. Prerequisite: BI416 & BI416L, or equivalent. Corequisite: BI425/G/L. STUDENTS ARE NOT PERMITTED TO ENROLL IN 300- OR 400- LEVEL COURSES UNTIL THEY HAVE COMPLETED EN111 WITH A GRADE OF "C" OR BETTER AND MA085 LEVEL II OR MA084B OR ANY HIGHER-LEVEL MATH COURSE.

BI-425/G/L MOLECULAR MEDICINE LABORATORY

SPRING ONLY/AS REQUIRED

2 credit hours

BI 425/G/L is the molecular biology laboratory course that is taken concurrently with BI425G. In this course, expression and control of eukaryotic genes is investigated in a research project format. Laboratory work involves the use of RNA & DNA techniques, protein methods, reporter gene assays, fluorescence microscopy, and the use of molecular biological computer databases to predict structure and function from nucleic acid & protein sequences. Prerequisites: BI416 & BI416L, or equivalent. Corequisite: BI425G. STUDENTS ARE NOT PERMITTED TO ENROLL IN 300- OR 400- LEVEL COURSES UNTIL THEY HAVE COMPLETED EN111 WITH A GRADE OF "C" OR BETTER AND MA085 LEVEL II OR MA084B OR ANY HIGHER-LEVEL MATH COURSE.

BI-474G MARINE BOTANY

SPRING ONLY/ODD YEARS

4 credit hours

This course provides students an in-depth exploration of the marine plants in the region with an emphasis on how the physiology and ecology of seaweeds and microalgae relate to environmental conditions in the sea. Prerequisite: BI302. STUDENTS ARE NOT PERMITTED TO ENROLL IN 300- OR 400- LEVEL COURSES UNTIL THEY HAVE COMPLETED EN111 WITH A GRADE OF "C" OR BETTER AND MA085 LEVEL II OR MA084B OR ANY HIGHER-LEVEL MATH COURSE.

BI-475G ADVANCED ANIMAL PHYSIOLOGY

SPRING ONLY/ALL YEARS

3 credit hours

Advanced Animal Physiology will acquaint students with the principles of animal form and function by examining how a diversity of animals cope with environmental challenges. Animal Physiology integrates the evolution of physiological system examined across major taxa, ranging from protists through vertebrates and across levels of biological organization from molecules to populations. Topics cover how the law of chemistry and physics govern the physiology of cell signaling, endocrine regulation, osmoregulation, gas exchange, thermoregulation, circulation, locomotion, basic and advanced neurophysiology, learning and memory and receptor physiology. These principles are examined within the context of physiological diversity among animals and their evolutionary processes. Prerequisite: BI320, BI315L, and BI321. Corequisite: BI475G/L. STUDENTS ARE NOT PERMITTED TO ENROLL IN 300- OR 400-LEVEL COURSES UNTIL THEY HAVE COMPLETED EN111 WITH A GRADE OF "C" OR BETTER AND MA085 LEVEL II OR MA084B OR ANY HIGHER-LEVEL MATH COURSE.

BI-475G/L ADVANCED ANIMAL PHYSIOLOGY

SPRING ONLY/ALL YEARS

3 credit hours

Advanced Animal Physiology will acquaint students with the principles of animal form and function by examining how a diversity of animals cope with environmental challenges. Animal Physiology integrates the evolution of physiological system examined across major taxa, ranging from protists through vertebrates and across levels of biological organization from molecules to populations. Topics cover how the law of chemistry and physics govern the physiology of cell signaling, endocrine regulation, osmoregulation, gas exchange, thermoregulation, circulation, locomotion, basic and advanced neurophysiology, learning and memory and receptor physiology. These principles are examined within the context of physiological diversity among animals and their evolutionary processes. Prerequisite: BI320, BI315L, and BI321. Co requisite: BI475G

BI-503 BIOLOGICAL LITERATURE AND SCIENTIFIC

SPRING ONLY/ALL YEARS

2 credit hours

Survey of biological literature as an assist in thesis and manuscript preparation in the areas of writing, proofreading, literature citation, figure and table preparation. Two hours of lecture weekly.

BI-507 ADVANCED STATISTICAL METHODS

FALL ONLY/ALL YEARS

4 credit hours

An advanced course in applied statistical methods as used in the biological and environmental sciences stressing the design and analysis of experimental and observational studies. Lectures will be 3 hours per week. Prerequisites: MA385 or equivalent.

BI-508 SCIENTIFIC COMPETENCE AND INTEGRITY

FALL ONLY/ALL YEARS

3 credit hours

This course examines historical, philosophical, methodological, ethical, and moral aspects of scientific thought and practice in the context of both historical and contemporary issues in natural and environmental science. Readings and discussions are built around classical examples such as the scientific controversy over Continental Drift and Plate Tectonics as well as contemporary environmental issues, ranging from global concerns such as climate and sea level change, to local public concerns such as solid waste management and the safety of tap water. The central objective of the course is to develop the skills and habits of sound critical thinking essential to the progress, ethical practice, and moral application of science.

BI-515 ADVANCES IN BIOGEOGRAPHY

FALL ONLY/EVEN YEARS

3 credit hours

This course presents the fundamentals of biogeography, and then focuses on recent advances in theory and method. Topics include the distribution of plants and animals over space and time, defining metapopulations, reconstructing biogeographic history and the theory of island biogeography. Students will be given hands-on experience with the latest analytical tools used for hypothesis testing. Emphasis will be on marine organisms, including algae, invertebrates and fish. Three hours of lectures per week.

BI-520 CURRENT TOPICS IN CELLULAR BIOLOGY

SPRING ONLY/ODD YEARS

3 credit hours

Important background information in biochemistry, cellular physiology, and molecular biology, with emphasis on recent scientific articles, new techniques and advances in the field. Application of new techniques and advances toward biotechnology and medicine will be discussed. Students will be required to actively participate in discussions, critique scientific articles, make oral presentations, and write a research paper. Prerequisite: BI101a-b or equivalent, or consent of instructor.

BI-525 EVOLUTIONARY BIOLOGY

FALL ONLY/EVEN YEARS

3 credit hours

This course provides a survey of the origin and evolution of life on Earth, exploring the history and major features of evolutionary change through time and the mechanisms responsible for those changes. The course will also consider evolutionary aspects of genetics, development, ecology, biogeography, systematics and paleontology. Prerequisite: Genetics or consent of instructor.

BI-529A ENVIRONMENTAL CONTAMINATION &

SPRING ONLY/EVEN YEARS

3 credit hours

This course covers the fundamental principles and mechanisms governing the interaction of pollutants with natural systems. The basic concepts of classical and environmental toxicology are also addressed with emphasis on contaminant absorption, distribution, metabolism, systemic toxicology, carcinogenesis, toxicity testing and risk assessment. The course concludes with a general introduction to air, land and water pollution. Three hours of lectures weekly. Prerequisites: BI157, BI158, CH102 and CH103 or equivalent.



BI-529B ENVIRONMENTAL CONTAMINATION &

SPRING ONLY/ODD YEARS

3 credit hours

This course focuses on classic and contemporary groups of environmental contaminants and their impact on organisms, ecosystems and man. Physical and chemical properties of each contaminant group are discussed in relation to their environmental distribution, fate and toxicity. Occupational health related pollution problems and pollution monitoring strategies are also discussed. Three hours of lectures a week. Prerequisites: BI157, BI158, CH102 and CH102, or equivalent, or consent of instructor. EV/BI529a is also highly recommended as it provides the foundations upon which EV/BI529b is built. Undergraduates may enroll in the course with instructor's consent.

BI-531 BEHAVIORAL ECOLOGY

FALL ONLY/ODD YEARS

3 credit hours

Review and discussions of current topics in behavioral ecology. These include game theory, foraging strategies, mating systems, predator-prey interactions, animal communication, and the ecological determinants of social behavior. Prerequisite: BI101a-b or equivalent, or consent of instructor.

BI-540 ICHTHYOLOGY

SPRING ONLY/EVEN YEARS

3 credit hours

This course is a survey of the classification and morphology of fishes with emphasis on local forms. It includes three hours of lecture weekly. The lab, BI440L, MUST be taken concurrently. Prerequisite: BI157-157L and BI158-158L or equivalent. Corequisite: BI440L.

BI-540L ICHTHYOLOGY LABORATORY

SPRING ONLY/EVEN YEARS

1 credit hour

This course is the laboratory portion of BI540G and MUST be taken concurrently. The course consists of one three-hour laboratory period per week. Prerequisite: BI157-157L and BI158-158L or equivalent. Corequisite: BI540G.

BI-546 MARINE INVERTEBRATES

FALL ONLY/EVEN YEARS

4 credit hours

Survey of the classification and morphology of marine invertebrates, with emphasis on local forms. Six hours of lecture-laboratory weekly.

BI-557 POPULATION ECOLOGY

FALL ONLY/ODD YEARS

3 credit hours

This course provides a quantitative background of the processes and principles associated with population dynamics. Both theoretical approaches and applied modeling techniques are used to help students visualize patterns observed in natural systems. The course is relevant for both marine and terrestrial biology or environmental science graduate students, however, examples are mainly focused on marine ecosystems, and coral reefs in particular. Prerequisites: BI157-157L and BI158-158L. Corequisite: BI410.

BI-557L POPULATION ECOLOGY LABORATORY

FALL ONLY/ODD YEARS

1 credit hour



This lab is required for BI/EV557, "Population Ecology". The labs provide a quantitative background of the processes and principles associated with population dynamics. Labs consist of applied modeling techniques to help students visualize patterns observed in natural systems. The course is relevant for both marine and terrestrial biology or environmental science graduate students, however, examples are mainly focused on marine ecosystems, and coral reefs in particular. Prerequisites: BI157-157L and BI158-158L. Corequisite: BI410.

BI-581 PHYSICAL OCEANOGRAPHY

SPRING ONLY/EVEN YEARS

3 credit hours

This course is intended to give students a view to how wind, radiation, gravity, friction, and the Earth's rotation determine the ocean's temperature and salinity patterns and currents. Some important processes we study include heat budget of the oceans, exchange of heat with the atmosphere and the role of the ocean in climate, surface mixed layer waves in the ocean, geostrophy, Ekman transport, and Rossby waves. Students learn how to explain physical features of the ocean ranging from microscopic turbulence to global circulation. Prerequisites: MA203 OR CONSENT OF INSTRUCTOR. Recommended: MA204, PH-251 and PH-252.

BI-691 SEMINAR

FALL/SPRING/ALL YEARS

1 credit hour

BI-695 THESIS

FALL/SPRING/ALL YEARS

1 - 6 credit hours