

BIOLOGY (BI)

BI 5000 Biology Graduate Skills Seminar (0.5)

Pathways and expectations for a Biology Masters degree and crucial skills for degree completion and science career success will be covered. Activities will include orientation to the student handbook, peer mentorship, scaffolded writing activities, scientific reading practice, and presentation of research results or a thesis proposal. Biology graduate students will take this course in their first and second year. Prerequisite(s): admittance to the MS in Biology program. Repeatable twice. Pass/No Pass. Falls.

BI 5105 Biology Colloquium (0.5)

Students will present updates on their research progress, attend lectures of prominent outside speakers, as well as attend and provide feedback for undergraduate student presentations. Repeatable twice. Pass/No Pass. Springs.

BI 5130 Ecology (3)

Fundamental ecological concepts which illustrate the complex interrelationships of living organisms with each other and with the non-living environment will be the focus of the course. Laboratory time used for field work, experimentation and analysis of data will be incorporated. Graduate students will have additional coursework and/or projects equivalent to graduate level study. Falls.

BI 5150 Animal Physiology (3)

This course will examine the various systems of the body including the respiratory, cardiovascular, digestive and excretory systems using a comparative approach. Discusses the control of these systems and behavior by the nervous and endocrine systems. Inherent is an analysis of an interaction between the mechanisms of homeostatic regulation and the environment. Laboratory investigations using local animals illustrate some of the principles outlined in lecture through the use of student and/or instructor generated hypothesis testing and uses modern equipment including computers, Data Acquisition Units, amplifiers, transducers, stimulators and activity monitors. Spring of even years.

BI 5160 Neurobiology (3)

Examines the functioning of the nervous system in vertebrates and invertebrates. The fundamental principles underlying membrane potentials, action potentials and conduction are followed by mechanisms of communication between single cells and groups of cells. Different aspects of sensory, motor and integrative physiology are discussed and the role of specific parts of the brain is explored. The laboratory portion is used to demonstrate certain principles and phenomena discussed in lecture. The laboratory involves a series of student-driven mini-projects. Students use computers, Data Acquisition Units, oscilloscopes, manipulators, transducers and amplifiers to test student and/or instructor generated hypothesis. Spring of odd years.

BI 5170 Ecology and Development (3)

This course will expose students to ecological developmental biology, an integrative field that concerns the impact of the environment and ecological factors on developmental processes. We will explore a suite of modern studies of developmental phenomena influenced by the environment and explore case studies in a wide range of vertebrates and invertebrates.

BI 5185 Molecular Biology (3)

This course gives students an in-depth analysis of molecular concepts in biology. A seminar-style approach will be used to examine chromosome and protein structure/function, epigenetics, mechanisms, and regulation of DNA replication, repair, transcription, translation, cell signaling patterns, and the cell cycle. The laboratory component is project-based, and particularly addresses methods in DNA manipulation, quantitative PCR, and mammalian cell culture. Graduate students will pursue activity equivalent to graduate level study. Additional course fee required. Falls.

BI 5200 Methods in Biostatistical Analysis (3)

Overview of biostatistical methods including formulating hypotheses, designing experiments, and choosing proper statistical tests. Identification of tools for association, difference of means, parametric, and non-parametric data will be discussed. The style of the course will be a seminar where students will help identify content, read materials beforehand, and class time will be dedicated to discussion and active manipulation of datasets.

BI 5560 Special Topics Bio Sciences (1-3)

Lectures on special topics in selected areas of the Biological Sciences. May be repeated in the same or separate terms, as topics vary, to a maximum of 9 graduate hours.

BI 5600 Current Environmental Issues (3)

In this course students and faculty examine the main issues that face ecologists, biologists and policy-makers regarding the health of the biosphere. The current state of understanding of such issues as global warming, ozone depletion, acid deposition, loss of biodiversity, pollution and desertification is elucidated through a combination of lectures, student presentations, seminars and discussions. Graduate students taking the course write an Environmental Master Plan for their home town and write an additional topical paper on the issue of their choice.

BI 5620 Developmental Biology (3)

This course will cover a broad range of topics in the field of modern and classic developmental biology. Importantly, we will learn how the scientific method is used within the context of developmental biology – the scope, questions, methods and limits of those engaged in investigations of developmental phenomena. Thus, by the end of the semester, you will: possess knowledge of the history and nature of developmental biology as well as classic and modern approaches to studying development; understand the genetic, molecular and cellular context of developmental processes; examine case studies illuminating the patterns and processes of development in invertebrates and vertebrates; understand key questions in developmental biology and the descriptive and experimental toolkit available to address them; i.e. the scientific method at work in developmental biology; observe embryogenesis and post-embryonic development in several animal species in the lab.

BI 5810 University Biology Teaching (1)

A course designed for graduate students interested in learning more about teaching biology effectively at the University level. The format of the course will primarily be discussion-oriented with contributions from faculty both in and outside of the Department of Biological Sciences. You should either be currently teaching or have taught at the college level. Typically the course will cover three areas: teaching and learning, the academic job market, and faculty life.

BI 5910 Independent Study - Biology (1-4)

Original research done in an area of the student's choosing in conjunction with a sponsoring faculty member. Results must be presented at a scientific conference.

BI 5950 Thesis Research - Biology (1-12)

Supervised execution of thesis research.

Prerequisite(s): permission of advisor after submission of a thesis proposal to committee. Repeatable up to 12 credits. Pass/No Pass.