

BIOLOGY

BI-917 Topics in Cell and Molecular Biology

Each topic is a lecture and/or laboratory course in a selected area of cell and molecular biology presented by a departmental instructor and/or guest lecturer when appropriate. Topic to be announced in advance. May be repeated as long as cell and molecular biology topics differ.

Prerequisite: Matriculation in the Biology or Biotechnology MS program, or permission of graduate coordinator and/or instructor.

Other or on demand and every 2-3 years. 3-4 Credits

BI-918 Topics in Genetics and Genomics

Each topic is a lecture and/or laboratory course in a selected area of genetics or genomics presented by a departmental instructor and/or guest lecturer when appropriate. Topic to be announced in advance. May be repeated as long as genetics and genomics topics differ. Prerequisite: Matriculation in the Biology or Biotechnology MS program, or permission of graduate coordinator and/or instructor

Other or on demand and every 2-3 years. 3-4 Credits

BI-921 Biotechnology and DNA

Applications of recombinant DNA technology, together with business and industry information and government regulations. Includes a three hour laboratory.

Every year. 4 Credits

BI-923 Fermentation Technology

The growth of microorganisms in bioreactors under sterile conditions and the production of useful products.

Other or on demand and other or on demand. 3 Credits

BI-927 Tissue Culture Techniques

Presents the most important techniques used for mammalian tissue culture by lecture and laboratory demonstration and practice. The course also includes topics in plant tissue culture. (Prereq: BS in biological science)

Spring only and every year. 4 Credits

BI-930 Biological Chemistry

Concerns the physical, chemical, and biological properties and metabolism of carbohydrates, proteins, lipids, DNA and RNA.

3 Credits

BI-936 Immunology

Recent advances in understanding the immune system will be covered. B.S. in a biological science is required. This course integrates both lecture and lab activities.

3 Credits

BI-937 Molecular Virology

A study of virus families with emphasis on replication and regulation of gene expression. B.S. in biology science required. This course integrates both lecture and lab activities.

3 Credits

BI-938 Toxicology

A theoretical course presenting the principles and mechanisms of toxic damage to cells, organs and organisms.

3 Credits

BI-941 Topics in Physiology

Each topic is a lecture and/or laboratory course in a selected area of physiology presented by a departmental instructor and/or guest lecturer when appropriate. Topic to be announced in advance. May be repeated as long as physiology topics differ. Prerequisite: Matriculation in the Biology or Biotechnology MS program, or permission of graduate coordinator and/or instructor

Other or on demand and every 2-3 years. 3-4 Credits

BI-942 Biostatistical Analysis and Experimental Design

Provides a foundation in biological data analysis and interpretation as well as experimental design, discussing the underlying principles of how scientific investigations are conducted to maximize the validity of the results. This course will guide students through the process of developing a scientific question and a hypothesis, designing appropriate experimental methods, selecting and using relevant statistical tools, interpreting results, and conveying results to a scientific audience in multiple formats.

Fall only and every year. 4 Credits

BI-943 Experimental Design

Prerequisites: Undergraduate degree in Biology, Chemistry or related field completion of a college course in statistics and completion of math which includes pre-calculus or higher level courses.

The underlying principles of how scientific investigations are conducted in order to maximize the validity of the results will be discussed. This course will cover the philosophy of science as it pertains to experiments, methods of experimental design, statistical inference, analysis and presentation of data, and clear communication of scientific results.

Fall only and every 2-3 years. 3 Credits

BI-950 Physiological Ecology

Considers the physiological adjustments which animals make in response to environmental factors; emphasizes the physiological basis of animal evolution and distribution.

3 Credits

BI-951 Topics in Ecology and Evolution

Each topic is a lecture and/or laboratory course in a selected area of ecology or evolution presented by a departmental instructor and/or guest lecturer when appropriate. Topic to be announced in advance. [3 credits for lecture only course and 4 credits w/ lab]. May be repeated as long as ecology and evolution topics differ. Prerequisite: Matriculation in the Biology or Biotechnology MS program, or permission of graduate coordinator and/or instructor

Other or on demand and every 2-3 years. 3-4 Credits

BI-952 Topics in Zoology

Each topic is a lecture and/or laboratory course in a selected area of animal biology presented by a departmental instructor and/or guest lecturer when appropriate. Topic to be announced in advance. May be repeated as long as zoology topic differs. Prerequisite: Matriculation in the Biology or Biotechnology MS program, or permission of graduate coordinator and/or instructor

Other or on demand and every 2-3 years. 3-4 Credits

BI-968 Cancer Biology

Cancer results from genomic mutations that compromise the mechanisms that normally regulate cell growth and proliferation, cell death, and cell-cell interactions. This course will examine how cancer cells differ from normal cells (morphologically, behaviorally, and in the functioning of molecular pathways), the genetic basis of cancer, how cells progress from a normal to a cancerous state, factors that promote cancer development, and strategies for cancer therapy. It will also include examination of the historical evolution of our understanding of cancer and societal issues related to cancer. Prerequisite: Undergraduate courses in Genetics and Biochemistry or permission of instructor. Other or on demand and every 2-3 years. 3 Credits

BI-980 Selected Topics: Advanced Biology

Each topic is a timely and exciting new lecture and/or laboratory course. Topics will be announced in advance and will service needs in growth areas; e.g., biotechnology. 1-4 Credits

BI-981 Independent Study in Biology/ Biotechnology

Independent study or directed study on a topic of interest to both the student(s) and the instructor. Other or on demand. 1-6 Credits

BI-983 Techniques in Laboratory and Field Resea**LASC Categories: LAB**

Students will carry out an experimental research project in a topic area defined by the instructor. Projects may involve laboratory- or field-based research, or a combination of the two. Research topic areas will be announced in advance. Prerequisite: Matriculation in the Biology or Biotechnology MS program, or permission of graduate coordinator and/or instructor. Other or on demand and every year. 4 Credits

BI-985 Graduate Internship in Biology/ Biotechnology

Requires successful completion of a minimum of twelve graduate credits toward the degree and approval of the Biology faculty. Provides Master of Science candidates the chance to gain practical experience at off-campus agencies where technical and analytical skills can be gained. 3-4 Credits

BI-990 Seminar in Biology/Biotechnology

Study and discussion of current researches, books, and periodicals in the field of biology; includes reports of research in progress. 3 Credits

BI-995 Research in Biology/Biotechnology

Original research in biology under faculty supervision. Requires an acceptable written thesis or paper in publishable format. 1-6 Credits

BI-996 Thesis Research I

Prerequisites: Completion of at least four Biology/Biotechnology master's courses, with BI-942 Biostatistical Analysis and Experimental Design being one of these courses (or taken concurrently), and permission of the Program Coordinator. Matriculated students only.

Original, experimental research in biology or biotechnology under faculty supervision, working toward production of a written thesis in an approved format. A research problem will be identified and a literature search conducted. For students choosing the experimental track of the MS in Biology program (designated Track II) and all students in the MS in Biotechnology program, experiments will be designed and planned, and preliminary research work may be performed. This course is the first course in a series of research coursework (BI 996, BI 997, BI 998) leading to completion of a thesis research project. Fall and Spring and every year. 3 Credits

BI-997 Thesis Research II

Prerequisites: BI-996 Thesis Research I, permission of Program Coordinator. Matriculated students only.

Original research in biology or biotechnology under faculty supervision, working toward production of a written thesis, in a approved format. Experimental laboratory work will be performed and results evaluated. This course is a continuation of BI 996: Thesis Research I. Fall and Spring and every year. 3 Credits

BI-998 Thesis Writing

Prerequisites: BI 996 Thesis Research I and BI 997 Thesis Research II (for the M.S. in Biotechnology, or the experimental track of the M.S. in Biology, Track II) and permission of Program Coordinator. Matriculated students only.

Preparation of a thesis, written in an approved format, describing original, experimental research or literature-based research in biology or biotechnology under faculty supervision, and presentation of an oral thesis defense. This course will follow BI 996: Thesis Research I and BI 997: Thesis Research II for all students in the MS in Biotechnology program and for those students choosing the experimental track for the MS in Biology program, Track II . Fall and Spring and every year. 3 Credits

BI-999 Biology Research Review

Prerequisites: Completion of BI-942: Biostatistical Analysis Experimental Design and BI-983: Techniques in Laboratory and Field Research, at least 3 elective courses in the MS in Biology program, and permission of Program Coordinator. Matriculated students only.

Preparation of a written, comprehensive literature review on an approved topic in the biological sciences under the supervision of an Biology or Biotechnology graduate faculty member, leading to an oral defense. Students can complete this 4-credit class in one semester, or over a maximum of 2 semesters totaling 4 credits. Course may be repeated. Other or on demand and other or on demand. 1-4 Credits