

BIOTECHNOLOGY (BIOT)

Course numbers with the # symbol included (e.g. #400) have not been taught in the last 3 years.

BIOT 825 - Biotech Products and Regulation

Credits: 3

The biopharma industry begins with foundations in basic science and works through various stages to turn ideas into marketable therapies. The business, clinical, and regulatory steps that are required to bring a product to market are important to understand in order to maximize ones effectiveness in any department in a biopharma setting. This course draws upon field experts to help deliver the content and tackle important discussions about the processes involved in drug development.

BIOT 835 - Cell Biology

Credits: 3

This course is an upper level biology class that expands on the basic knowledge of cellular structure and function. The focus will be on molecular biology and cell signaling. Research methods and experiments but preeminent scientists will be explored and analyzed.

BIOT 837 - Microbial Genomics

Credits: 0 or 3

Microbial genomes (primarily bacteria and bacteriophages) and genome-scale approaches to addressing questions in microbial physiology and pathogenesis will be the focus of this course. Large-scale sequencing projects, genome structure and evolution, metagenomics, and other challenges in comparative genomics, will be discussed. Hands-on wet laboratory and bioinformatics projects will be included in this laboratory-lecture course.

BIOT 847 - Industrial Microbiology and Fermentation

Credits: 3

Production of biologics and food by the biotechnology and agribusiness industries is the major focus of this course. Development of procedures for fermentation and bioprocessing, from proof of concept through scale-up stages will be emphasized, utilizing both theory and quantitative understanding as well as hands-on wet lab experience with modern bioprocessing equipment. Troubleshooting, safety, and QC considerations will be addressed.

BIOT 850 - Cancer Biology: From Benchtop Research to Therapeutic Interventions

Credits: 3

The development and progression of cancer can be defined by several molecular and cellular biological characteristics. In this course, we will utilize primary literature to begin to understand (1) how specific cellular processes are altered during cancer initiation and progression; (2) how different cancers and the genetic landscape underlying them are being studied using models in the laboratory; and (3) how innovative therapeutics are being designed to target tumors based upon their individual molecular signatures.

BIOT 853 - Cell Culture

Credits: 0 or 3

Principles and technical skills fundamental to the culture of animal cells. Introduction to the techniques of sub-culturing, establishing primary cultures, karyotyping, cloning, growth curves, and cryopreservation. Techniques involving culturing mammalian cells in bioreactors will be introduced. Application of cell culture to contemporary research in biotechnology through independent projects.

BIOT 865 - Nucleic Acid Techniques

Credits: 3

Lecture and laboratory course focused on application of molecular biology techniques for the extraction, detection, and use of nucleic acids. Emphasis will be on recombinant DNA cloning and bioengineering techniques in biotechnology.

BIOT 866 - Protein and Immunological Techniques

Credits: 3

Laboratory course focused on application of molecular biology techniques of the isolation, quantitation, detection, analysis, and use of proteins. Substantial emphasis will be on the use of immunoassays and antibodies in protein work. Modern proteomics techniques will also be discussed. Emphasis will be on recombinant protein expression in the field of biotechnology.

BIOT 877 - Molecular Biology and Biotechnology

Credits: 3

The organization, expression, and control of RNA and protein-coding genes in prokaryotic and eukaryotic cells. The focus of the course is on mechanisms of genetics at the molecular level and the application of modern techniques to laboratory biotechnology projects.

BIOT 891 - Applied Research

Credits: 3-6

The applied research experience enhances the student's academic achievements with real-world, professional industry projects through placement at biopharma industry organizations. The student is expected to apply knowledge and skills acquired through other coursework in the major to address and solve new, authentic problems identified by the employer. Under the direction of a faculty advisor and workplace supervisor, the student is expected to contribute effectively within a team at the organization.

Repeat Rule: May be repeated for a maximum of 6 credits.

BIOT 892 - Graduate Internship

Credits: 3-6

The internship experience enhances the student's academic achievements with real-world, professional industry projects through placement at biopharma industry organizations. The student is expected to apply knowledge and skills acquired through other coursework in the major to address and solve new, authentic problems identified by the internship employer. Under the direction of a faculty advisor and workplace supervisor, the student is expected to contribute effectively within a team at the organization.

Repeat Rule: May be repeated for a maximum of 6 credits.

BIOT 893 - Directed Graduate Research

Credits: 3-6

The research project experience enhances the student's academic achievements with a project-based experience in an academics lab. The student is expected to apply knowledge and skills acquired through other coursework in the major to address and solve new, authentic basic or applied science questions under the direction of a faculty advisor. The student is expected to contribute effectively within a lab team.

Repeat Rule: May be repeated for a maximum of 6 credits.

BIOT 895 - Graduate Co-op Experience

Credits: 10

This intensive internship experience enhances the student's academic achievements with real-world, professional industry projects through placement at a biopharma industry organizations. The student is expected to apply knowledge and skills acquired through other coursework in the major by working in an industry setting alongside professionals to hone their technical and business skills. Under the direction of a faculty advisor and workplace supervisor, the student is expected to contribute effectively within a team at the organization.

BIOT 896 - Graduate Seminar in Biotechnology

Credits: 1

The graduate seminar in biotechnology will run each semester with different topics. 1) Cutting-edge issues facing the biotech industry will be encountered through case studies in order to apply what is being learner in other courses, hone communication skills, and stay up to date in the fields. 2) Instrumentation and technologies utilized in the biotechnology industry will be described through lectures, readings, and site visits to nearby facilities.

BIOT 897 - Special Topics in Biotechnology

Credits: 1-3

This course explores and investigates advanced topics in biotechnology that would not normally be covered in other courses in the curriculum.

Repeat Rule: May be repeated for a maximum of 9 credits.