

BIOTECHNOLOGY (BIOT)

BIOT 415 - Millyard Scholars Seminar

Credits: 2

Through in-class activities, workshops and guest speakers, students in the Millyard Scholars Program will explore career paths, and develop resources and skills for academic success. All student work, planning and experiences will be showcased in a digital portfolio.

Equivalent(s): BSCI 415

BIOT 418 - Phage Bioinformatics Lab

Credits: 2

In the course, students undertake a hands-on undergraduate research experience to describe, document, and publish the discovery of new bacteriophages (bacterial viruses). In doing so, students will elucidate how the genome codes biological information. The aim of the course is for students to develop further research and computational analysis skills while preparing to publish their scientific discoveries. The course will focus on research data analysis and presentation of research data to scientists and the public.

Equivalent(s): BSCI 418

BIOT 422 - Biotechnology and Society

Credits: 4

Provides a basic understanding of genetic engineering. Techniques discussed include cloning, gene transfer, the polymerase chain reaction (PCR), in vitro fertilization, organ transplants, and paternity testing. Ethical issues involved with each technological advance are examined.

Attributes: Biological Science(Discovery)

Equivalent(s): BSCI 422

Mutual Exclusion: No credit for students who have taken BIOL 444A.

BIOT 501 - Ethical Issues in Biology

Credits: 4

This course is an introduction to the ethical issues associated with current and future use of biotechnology. Students will think critically about different ethical problems that emerge from scientific research and its applications to medical technology. The focus will be on personal and public policy decision making. Prereq: BIOL 413 and 414 or BIOL 411 and BIOL 412.

Attributes: Writing Intensive Course

Equivalent(s): BSCI 501

BIOT 502 - Introduction to Biotechnology Manufacturing

Credits: 4

Introduction to the terminology and practices of the biotechnology industry, with an emphasis on the business, regulatory, legal, and basic scientific underpinnings of modern biotechnology in the commercial and government sectors.

Equivalent(s): BSCI 502

BIOT 510 - Introduction to Biofabrication

Credits: 4

This project-based course introduces students to the techniques and challenges of biofabrication. Students learn how additive manufacturing is used to combine cells with a variety of biolinks to create living tissues such as skin, cartilage, vascularized bone, and blood vessels. During this process students learn how to design for and operate 3D printing and bioprinting equipment. An emphasis will be placed on the ways in which this emerging technology impacts our society.

Equivalent(s): BSCI 510

BIOT 515 - Second Year Millyard Scholars Seminar

Credits: 2

The Millyard Scholars Second Year Seminar will introduce students to a series of data analytics methods employed in biotech research and clinical settings in order to promote problem solving and critical thinking skills. Recent data generated from the biotech research and from clinical trials will form the basis of the data analyzed during the course. Guest speakers will help inform discussions about the importance of data analytics in biotechnology and in clinical settings. Cr/F.

BIOT 655 - Advanced Phage Biology

Credits: 4

Students undertake an advanced exploration of bacteriophage biology through wet-lab and/or bioinformatic investigation of previously-discovered bacterial viruses. In the setting of bacteriophage genome study, students develop working fluency with coding of genetic information, annotation of genomes, publication and presentation of discoveries, and design of experiments to assess questions in viral structure and function. Prereq: BSCI 418 or BMS 503.

Repeat Rule: May be repeated for a maximum of 8 credits.

BIOT 747 - Industrial Microbiology and Fermentation

Credits: 0 or 5

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. Prereq: BMS 503, BMS 504. Special fee.

Equivalent(s): BSCI 606, BSCI 747

BIOT 753 - Cell Culture Lecture

Credits: 3

Fundamental biological principles that underlie cell culture and its applications are the foundation of the lecture component of this course. Applications of cell culture techniques to current research areas in academic and biopharmaceutical settings will be discussed. Prereq: BMS 503 and BMS 604.

Co-requisite: BIOT 754

Equivalent(s): BENG 620, BMCB 753, BMS 620

BIOT 754 - Cell Culture Lab

Credits: 2

Fundamental biological principles that underlie cell culture and its applications are the foundation of the lecture component of this course. Applications of cell culture techniques to current research areas in academic and biopharmaceutical settings will be discussed. Prereq: BMS 503 and BMS 504. Special Fee.

Co-requisite: BIOT 753

Equivalent(s): BENG 620, BMCB 753, BMS 620

BIOT 765 - Nucleic Acid Techniques

Credits: 4

Laboratory course focused on application of molecular biology techniques for the extraction, detection, and use of nucleic acids. Emphasis is on recombinant DNA cloning and bioengineering techniques in biotechnology. Special fee. Prereq: GEN 604.

Equivalent(s): BMCB 754, BMS 650, BSCI 765

BIOT 766 - Protein and Immunologic Techniques

Credits: 4

Laboratory course focused on application of molecular biology techniques for the isolation, quantitation, detection, analysis, and use of proteins. Substantial emphasis on the use of immunoassays and antibodies in protein work. Modern proteomics techniques are also discussed. Emphasis on recombinant protein expression in the field of biotechnology. Prereq: GEN 604. Special fee.

Equivalent(s): BSCI 766

BIOT 777 - Molecular Biology and Biotechnology

Credits: 5

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. Prereq: GEN 604. Special Fee.

Equivalent(s): BSCI 777

BIOT 799 - Seminar in Biotechnology

Credits: 2

The seminar in biotechnology will run from time to time with different topics, including the following: 1) Cutting-edge issues facing the biotechnology industry. 2) Instrumentation and technologies utilized in the biotechnology industry.

Repeat Rule: May be repeated for a maximum of 4 credits.