Biomanufacturing (14BTECM)

Description

The Minor in Biomanufacturing is intended to provide new graduates with the knowledge base and hands-on skills that will prepare them to quickly contribute to a cGMP biomanufacturing operation in significant ways and should reduce the time needed for on-the-job training in those operations. Interested students should contact the representatives listed below.

Requirements

Requirements for the undergraduate Minor in Biomanufacturing include a minimum of 15 credit hours as specified below: All courses must be completed with a grade of “C-” or higher:

A. Prerequisite Courses to Enter the Minor
All students must complete both CH 101 and BIO 183. The courses must be completed with a grade of C- or better.

B. Introductory Seminar Pertaining to Biomanufacturing (1 credit)
BEC 220 Introduction to Drug Development and Careers in Biomanufacturing

C. Basic Microbiology Laboratory Skills (2 or 1 credits)
Students must complete either BEC 363 (2 credits) or BIT 410 (4 credits) or MB 352/354 (1 credit)

D. Base Biomanufacturing Sequence (4 credits)
All students must complete:

- BEC(CHE) 463 Fermentation of Recombinant Microorganisms (2 credits)
- BEC 330 Principles and Applications of Bioseparations (2 credits)

E. Biomanufacturing Specialization (4 Credits)
Students must complete a two-course specialization sequence focused on either:

*Upstream Operations*

- BBS 426 Industrial Microbiology & Biomanufacturing Laboratory (2 credits) AND
- BEC 480 cGMP Fermentation Operations (2 credits)

*or*

*Downstream Operations*

- BEC 436 Introduction to Downstream Process Development (2 credits) AND
- BEC 485 cGMP Downstream Operations (2 credits)

F. Electives (choose at least 5 credits)
Students must complete 5 credits of courses from the list below. Courses used to complete Requirement E may not be used to complete Requirement F.

- BAE (BBS) 425 Industrial Microbiology and Bioprocessing
- BBS 426 Industrial Microbiology & Biomanufacturing Laboratory
- BCH 351/451 Principles of Biochemistry
- BEC 436 Downstream Processing of Biomaterials
- BEC 442 Insect Cells Protein Expression
- BEC 462 Bio-Nanotechnology Laboratory
- BEC 475 Global Regulatory Affairs for Medical Products
- BEC 480 cGMP Fermentation Operations
- BEC 485 cGMP Downstream Operations
- BEC 488 Animal Cell Culture Engineering
- BEC 497 Biomanufacturing Research Projects (2 credits maximum)
- BIT 410 Manipulation of Recombinant DNA (4 cr)
- GN 311 (previously GN 411) Principles of Genetics
- BIT 466 Animal Cell Culture
- MB 455 Microbial Biotechnology
- BME/BEC 483 Tissue Engineering Technologies

**Administration of the Minor in Biomanufacturing**

The BTEC staff will hold primary responsibility for administration of the Minor in Biomanufacturing. Information about the Minor and application materials will be handled by an Administrative Assistant and the Assistant Director for Student Coordination will be the primary contact and academic advisor for the students who elect to enroll in the Minor.

**Contacts**

For additional information about the Minor in Biomanufacturing contact:

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*SIS Code: 14BTECM*