Biotechnology: Genomics & Biomanufacturing
Associate in Science

DIVISION OF SCIENCE, TECHNOLOGY, ENGINEERING & MATHEMATICS

Biomanufacturing and Genomics technologies have a growing importance in the biopharmaceutical and biotechnology industry. This concentration program will introduce students to the ever-expanding industries related to biotechnology, biopharmaceutical, and biomedical sciences. The goal of this program is to introduce students to modern biological techniques, which they will use to apply their scientific knowledge and skills to real-world biotech research and academic problems and to train and educate students to acquire skill sets that are top in-demand techniques/expertise in the biotechnology industry, including genomics, biomanufacturing process, and biopharma R&D. These techniques include bioreactor use, in vivo and in vitro cell culturing, GMP-Good Manufacturing Practices, aseptic technique, genomic editing techniques like CRISPR, equipment prep, chromatography, assays for functional characterization, transcriptome analysis, and DNA sequencing analysis. Besides, students will learn soft critical skills, including critical thinking skills. These techniques will also provide a strong foundation for those students who are willing to pursue their career in four-year colleges/universities or advanced R&D laboratories. Since our biotechnology program is a research-based and peer mentoring intensive program structured to engage nontraditional students, our curriculum uses inquiry-based laboratories, hands-on instruction, and internships in world-renowned institutions to confer in-depth scientific knowledge to students.

Upon successful completion, the Associate in Science Degree in Biotechnology: Genomics & Biomanufacturing is awarded.

PROGRAM FOOTNOTES

Computer Science Electives:
- CS 100 Computers and Technology,
- CS 110 Introduction to Computer Science,
- CS 123 Python Programming

Humanities Electives:
- Art, Communication, English (EN 103 or higher), Film,
- Foreign Language, Humanities, Literature, Music,
- Oral Communication, Philosophy, Photography, Sign Language, Theater Arts

Social Science Electives:
- Anthropology, Economics, Geography, Government, History, Law, Psychology, Sociology

A grade of C or higher is required for all Biotechnology (BT) courses.

COURSE | COURSE TITLE | CREDITS
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First Year | Semester 1 |
BI 110 | Principles of Biology I | 4
BT 101 | Introduction to Biotechnology | 3
CH 110 | Principles of Chemistry I | 4
EN 101 | English Composition I | 3
MA 102 * | College Algebra | 3
**credits:** | | 17

First Year | Semester 2 |
BI 120 | Principles of Biology II | 4
BT 201 | Cell Culture | 3
CH 120 | Principles of Chemistry II | 4
Computer Science Elective | 3/4
EN 102 | English Composition II | 3
**credits:** | | 17/18

Second Year | Semester 1 |
BI 225 | Biomanufacturing I | 4
BI 246 | Molecular and Developmental Biology | 4
CH 201 | Organic Chemistry I | 4
Humanities/Social Science Elective | 3
**credits:** | | 15

Second Year | Semester 2 |
BT 202 | Genomics | 4
CH 210 | Biochemistry I | 4
CT 100 | Critical Thinking | 3
**credits:** | | 14

Second Year | Summer |
BT 240 | Biotechnology Internship | 4
**credits:** | | 4

**Total Credits:** 67/68

This program qualifies as an Alternative Transfer Agreement (MassTransfer) with select public institutions in Massachusetts. For more information, visit www.mass.edu/masstransfer.

Quantitative skills is a MassBay graduation competency for associate degree programs. Prior to graduation, students must demonstrate this competency by completing a 100-level math course (not MAC); or placing into a 200-level mathematics course.

*Pre-Calculus Mathematics (MA 104) may be substituted.

AY ‘21-’22