

BIT 120 - Introduction to Biotechnology

This course is designed to acquaint students with the field of biotechnology. Topics will include medical biotechnology, the drug discovery and development processes, and forensics. Techniques of the biotechnology industry, such as recombinant DNA technology, aseptic technique, bacterial transformation and protein purification shall be introduced. Issues that impact both the industry and the general population such as stem cell research, bioterrorism and bioethics are examined.

BIT 123 - Biotechnology Techniques and Instrumentation

This course will allow students to gain theoretical and practical, hands-on knowledge of the operation, maintenance and calibration of commonly used and specialized laboratory instrumentation. Laboratory procedures will include solution preparation, aseptic technique, protein separations and assays, electrophoresis and recombinant DNA technology. Students will be introduced to the concept of working with good laboratory practices as they pertain to documentation and record keeping. Discussion and implementation of laboratory safety policies will be key components to the course.

BIT 220 - Biotechnology Research

This course provides a foundation for the principles of molecular genetics as they apply to research performed in the biotechnology industry. Lecture topics will include transcription, translation, and protein expression as they pertain to both prokaryotic and eukaryotic gene regulation. The laboratory procedures will give hands on exposure to recombinant DNA technology such as cloning techniques (restriction digests, PCR, plasmid design, DNA purification, ligation, transformation and gel electrophoresis), protein purification, ELISA, Western Blot and cell culture.

BIT 232 - Biomanufacturing

This course provides a solid foundation in the biomanufacturing process of biopharmaceuticals, including production under current Good Manufacturing Practices. Students will use bacteria, mammalian, and/or yeast cells to produce human proteins using the tools of manufacturing, such as bioreactors for upstream processing and protein purification systems for downstream processing and quality control of protein production.

Industrial-Level Facilities

The biomanufacturing laboratory suite at MCCC is a fully-functional facility outfitted with state-of-the art equipment and instrumentation. Several highlights include:

- Bioreactors
- Gradient and isocratic HPLC units
- Tangential flow filtration systems
- UV-Vis spectrophotometers
- Fully functional cell culture suite
- Liquid chromatography system

Career Opportunities

The Biotechnology program is designed to successfully train and prepare students to enter the local workforce as research technicians or associates in areas such as biomedical labs, biomanufacturing facilities, clinical labs, and in quality control. For more information on these as well as other biotechnology career options, visit biotech-careers.org.

Employment Prospects

Regionally, employment of biological technicians is expected to increase by about 16% from 2012 to 2022.*

Regional Median Annual Salary	\$49,510
Number Employed in 2012	2,380
Projected Number Employed in 2020	2,760

*According to the Pennsylvania Bureau of Labor Statistics for the greater Philadelphia 5-county region.

Grant-Funded Program Support

NSF Award #1204974

U.S. Department of Labor under grant TC-23761-12-60-A-37. This product was funded by a grant awarded by the U.S. Department of Labor's Employment and Training administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

Biotechnology



Applied Associate's Degree



Montgomery County
Community College

Biotechnology Program

The Greater Philadelphia region is home to over 100 biotechnology and pharmaceutical companies. The MCCC Central Campus in Blue Bell offers a unique and comprehensive Biotechnology program that utilizes the tools, processes, and regulatory structure of this local industry sector. This STEM program offers advanced coursework with hands-on learning in state-of-the-art research and biomanufacturing laboratories. The Applied Associate's Degree (AAS) prepares students to directly enter the workforce; these students will be prepared for employment as skilled technicians in biotechnology, biomanufacturing, pharmaceutical and academic laboratories.

TRANSFER PATHWAY

The AAS degree was designed to accommodate students who wish to transfer to a four-year institution to complete a Bachelor's degree. Applicable biology, chemistry and math classes required for transfer institutions are substituted in this pathway. The MCCC Biotechnology program has direct articulation agreements with three local institutions: Thomas Jefferson university, Cabrini College, and West Chester University; and a transfer guide with Penn State Abington.



Degree Course Requirements

BIT 120	Introduction to Biotechnology	4
BIT 123	Techniques and Instrumentation for Biotechnology	4
BIT 220	Biotechnology Research	4
BIT 232	Biomanufacturing	4
BIO 121	General Biology I	4
BIO 140	Microbiology and Immunology	4
CHE 131	Chemistry for Technology I	4
CHE 132	Chemistry for Technology II	4
ENG 101	English Composition I	3
ENG 115	Writing for Technical Communications	3
HIS 101	History of Western Civilization I	3
MAT 100	Intermediate Algebra	3
MAT 131	Introduction to Statistics	3
SPC 120	Public Speaking	3
ELECTIVE¹	Laboratory Science	4
BIT 298/ ELECTIVE²	Laboratory Science	4-6
ELECTIVE	Core Goal 4: Computer Fluency	3
ELECTIVE	Core Goal 10: Exercise and Health Sciences	3

Total Credits 64-66

¹Choose one for the third semester elective:
 BIO 122 General Biology II
 BIO 130 Introductory Anatomy and Physiology
 BIO 131 or BIO 132 Human Anatomy and Physiology I or II
 BIO 260 Genetics
 PHY 121 or PHY 122 General Physics I or II

²Students may choose the 6 credit biotechnology internship course, or choose one of the above 4 credit laboratory science electives.

Degree Course Requirements— Transfer Pathway

BIT 120	Introduction to Biotechnology	4
BIT 123	Techniques and Instrumentation for Biotechnology	4
BIT 220	Biotechnology Research	4
BIT 232	Biomanufacturing	4
BIO 151	Principles of Biology I	4
BIO 152	Principles of Biology II	4
CHE 151	Principles of Chemistry I	4
CHE 152	Principles of Chemistry II	4
CHE 261	Organic Chemistry I	4
CHE 262	Organic Chemistry II	4
ENG 101	English Composition I	3
ENG 102	English Composition II	3
HIS 101	History of Western Civilization I	3
MAT 131	Introduction to Statistics	3
MAT 161	Pre-Calculus I	4
SPC 120	Public Speaking	3
ELECTIVE	Core Goal 4: Computer Fluency	3
ELECTIVE	Core Goal 10: Exercise and Health Sciences	3

Total Credits 65

Contact Information

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