BIOTECHNOLOGY, ASSOCIATE IN SCIENCE

Biotechnology is a rapidly growing industry with projections for continued growth and exciting opportunities for employment. The Biotechnology Program is one of several in the State with a comprehensive curriculum in biomanufacturing. This program is designed in consultation with members of local industry (Takeda, AMGEN Corporation, and others) to provide the essential technical experiences and training needed for this thriving field. The curriculum balances basic science courses with practical laboratory applications.

To earn an Associate in Science Degree with a major in Biotechnology, students complete 39 specified units plus General Education Degree Requirements.

Course ID	Title	Units/ Hours
Required Courses		
CHEM M01A	General Chemistry I [1]	5
or CHEM M01AH	Honors: General Chemistry I	
CHEM M01B	General Chemistry II [1]	5
MATH M15	Introductory Statistics	4
or MATH M15H	Honors: Introductory Statistics	
BIOL M02A	General Biology I	5
or BIOL M02AH	Honors: General Biology I	
MICR M01	General Microbiology	5
BIOT M10	Introduction to Biotechnology and Molecular Biology	4
or BIOL M13	Introduction to Biotechnology and Molecular Biology	
BIOT M02A	Environmental Control and Process Support	2
or BIOL M12A	Environmental Control and Process Support	
BIOT M02B	Manufacturing: Quality Control and Validation	2
or BIOL M12B	Manufacturing: Quality Control and Validation	
BIOT M02C	Manufacturing: Cell Culture and Microbial Fermentation	3
or BIOL M12C	Manufacturing: Cell Culture and Microbial Fermentation	
BIOT M02D	Bioprocessing: Recovery and Purification	2
or BIOL M12D	Bioprocessing: Recovery and Purification	
BIOT M02E	Business & Government Regulation	2
or BIOL M12E	Business & Government Regulation	
Total Required Major Units: 39		
MC General Education Pattern: 28		
Double-Counted Units: 9		
Electives to meet 60 associate degree units: 2		
Total Required for the AS Degree: 60		

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Students not planning for university transfer may substitute CHEM M12 Introductory Chemistry I/CHEM M13 Introductory Chemistry II for CHEM M01A General Chemistry I/CHEM M01AH Honors: General Chemistry I/CHEM M01B General Chemistry II.

Year 1		
Fall Semester		**Units/Hours**
BIOT M02A	Environmental Control and Process Support	2
BIOT M10	Introduction to Biotechnology and Molecular Biology	4
CHEM M01A	General Chemistry I	5
	Units/Hours	**11**
Spring Semester		
BIOL M02A	General Biology I	5
BIOT M02B	Manufacturing: Quality Control and Validation	2
CHEM M01B	General Chemistry II	5
MATH M15	Introductory Statistics	4
	Units/Hours	**16**
Year 2		
Fall Semester		
BIOT M02C	Manufacturing: Cell Culture and Microbial Fermentation	3
MICR M01	General Microbiology	5
	Units/Hours	**8**
Spring Semester		
BIOT M02D	Bioprocessing: Recovery and Purification	2
BIOT M02E	Business & Government Regulation	2
	Units/Hours	**4**
	Total Units/Hours	**39**

Upon successful completion of this program, students will be able to:

- identify the chronological sequence of steps needed to bring a biotechnology product from discovery to market.
- explain the operations that take place in an industrial biotechnology setting.
- assess and critique the extent to which they are meeting or exceeding the standards appropriate to biotechnology activities.