

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 or CHEM M01AH	General Chemistry I ¹ Honors: General Chemistry I	5
CHEM M01B	General Chemistry II ¹	5
MATH M15 or MATH M15H	Introductory Statistics Honors: Introductory Statistics	4
BIOL M02A or BIOL M02AH	General Biology I Honors: General Biology I	5
MICR M01	General Microbiology	5
BIOT M10 or BIOL M13	Introduction to Biotechnology and Molecular Biology Introduction to Biotechnology and Molecular Biology	4
BIOT M02A or BIOL M12A	Environmental Control and Process Support Environmental Control and Process Support	2
BIOT M02B or BIOL M12B	Manufacturing: Quality Control and Validation Manufacturing: Quality Control and Validation	2
BIOT M02C or BIOL M12C	Manufacturing: Cell Culture and Microbial Fermentation Manufacturing: Cell Culture and Microbial Fermentation	3
BIOT M02D or BIOL M12D	Bioprocessing: Recovery and Purification Bioprocessing: Recovery and Purification	2
BIOT M02E or BIOL M12E	Business & Government Regulation Business & Government Regulation	2
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		

Chemistry II for CHEM M01A General Chemistry I/CHEM M01AH
Honors: General Chemistry I/CHEM M01B General Chemistry II.

Year 1		Units/Hours
Fall Semester		
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.

¹ Students not planning for university transfer may substitute CHEM M12 Introductory Chemistry I/CHEM M13 Introductory