CERTIFICATE IN BIOMANUFACTURING

Biomanufacturing is a diverse industry merging large-scale manufacturing practices with biotechnology applications. Companies in this growing sector manufacture a variety of products, such as therapeutics, clinical diagnostic tests, food and beverages, dietary supplements, and biofuels. The Biomanufacturing Certificate of Achievement at Citrus College prepares students for in-demand entry-level positions in the local biomanufacturing industry. Upon completion of the program, students will be prepared to seek employment as biological technicians, manufacturing production technicians, quality control technicians, and environmental monitoring technicians. Students gain conceptual knowledge of biotechnology and its regulation, as well as extensive hands-on laboratory experience with industry-standard tools and equipment. The program also emphasizes workforce readiness, including resume writing and job interview skills.

Learning Outcomes

Certificate of Achievement Level Student Learning Outcomes

Students completing the Biomanufacturing Certificate of Achievement will:

1. Calibrate and safely operate standard equipment and instrumentation utilized in the biomanufacturing industry.
2. Document laboratory activities, experimental data, and manufacturing procedures following Good Documentation Practices (GDP) used in the biomanufacturing industry.
3. Explain the significance of and demonstrate proficiency in aseptic technique for maintaining product integrity in a biomanufacturing setting.
4. Prepare a variety of chemical solutions necessary for the biomanufacturing process and quality testing.
5. Prepare for a job interview and generate a resume appropriate for entry-level positions in the biomanufacturing industry.
6. Describe the principles of Good Manufacturing Practices (cGMP) and perform tasks in accordance with these standards and established safety procedures.

Requirements

Code	Title	Units
Required courses		
BIOT 107	Biotechnology: Transforming Society Through Biology	3-4
or BIOT 108	Intro to Biotechnology: Real World Biology Applications	
BIOT 110	Biotechnology I: Basic Lab Skills and Documentation	5
BIOT 125	Quality and Regulatory Practices in Biotechnology	3
BIOT 150	Biotechnology II: Biomanufacturing and Quality Principles	4
MATH 144	Technical Mathematics [1]	4-5
or MATH 165	Introduction to Statistics	
or MATH 165H	Introduction to Statistics - Honors	
Total Units		**19-21**

[1] MATH 165 is degree applicable with or without MATH 065. If taken with MATH 065, only the units for MATH 165 will be counted towards the degree.

Curriculum Map

1-Year Curriculum Map Example

This map represents one possible pathway through the program and is only for reference.

*It is highly recommended that you make an appointment (https://www.citruscollege.edu/stdntsrv/counsel/Pages/ApptSchedule.aspx) to create a customized education plan that fits your needs.

Note: Substitute ENGL 101E (5 units) may be needed based on placement.

Course	Title	Units
Fall Term 1		
BIOT 110	Biotechnology I: Basic Lab Skills and Documentation	5
BIOT 107 or BIOT 108	Biotechnology: Transforming Society Through Biology or Intro to Biotechnology: Real World Biology Applications	3
ENGL 101 or ENGL 101H	Reading and Composition or Reading and Composition - Honors	4
	Units	**12**
Spring Term 1		
BIOT 125	Quality and Regulatory Practices in Biotechnology	3
BIOT 150	Biotechnology II: Biomanufacturing and Quality Principles	4
MATH 144	Technical Mathematics	5
	Units	**12**
	Total Units	**24**

Note: Course selections may affect total unit value.

Career Information

Career Opportunities

There are a variety of careers you can do with this major.

To explore more about this major, schedule an appointment (https://www.citruscollege.edu/stdntsrv/ctcenter/Pages/ApptSchedule.aspx) with a career counselor.