

# A.S. IN BIOTECHNOLOGY

Biotechnology involves the application of biology to develop new products and technologies to combat disease, reduce our environmental impact, provide cleaner fuel sources, improve food production, and create safer industrial processes. The Citrus College Biotechnology A.S. degree includes a mix of basic science courses and hands-on laboratory classes designed to provide essential technical training and experiences necessary to thrive in this growing industry. Students will gain the conceptual knowledge, practical skills, and confidence to obtain entry-level employment as biological technicians, manufacturing production technicians, quality control technicians, and environmental monitoring technicians in bioscience laboratories and companies. The program emphasizes work readiness skills, such as resume writing, teamwork, and communication. This degree is intended for students who wish to enter the workforce upon completion.

## Learning Outcomes

### A.S. Degree Level Student Learning Outcomes

Students completing the Biotechnology A.S. Degree will:

1. Calibrate and safely operate standard equipment and instrumentation utilized in biotechnology.
2. Document laboratory activities, experimental data, and procedures following Good Documentation Practice (GDP).
3. Describe the principles of Good Laboratory Practice (GLP) and Good Manufacturing Practice (cGMP), and perform tasks in accordance with these standards and established safety procedures.
4. Explain how biotechnology tools may be applied to address societal challenges.
5. Describe key concepts in quality and how regulatory oversight shapes the biotechnology industry.
6. Prepare for a job interview and generate a resume appropriate for entry-level positions in biotechnology.

## Requirements

This degree requires meeting the Citrus College General Education and proficiency requirements combined with successful completion (grades of "C" and above) of the following major requirements:

Code	Title	Units
<b>Required courses:</b> <sup>1</sup>		
<i>Select either BIOT 107 or BIOT 108:</i>		
BIOT 107	Biotechnology: Transforming Society Through Biology	3
BIOT 108	Intro to Biotechnology: Real World Biology Applications	4
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 165	Introductory Statistics <sup>2</sup>	4

Code	Title	Units
or MATH 165H	Introductory Statistics - Honors	
<i>Select either chemistry sequence:</i>		
CHEM 103 & CHEM 104	College Chemistry I and College Chemistry II	10
CHEM 111 & CHEM 112	General Chemistry I and General Chemistry II	10
<b>Total Units</b>		<b>29-30</b>

<sup>1</sup> Students may need to fulfill prerequisites before enrolling in required courses. Students are advised to consult the Citrus College catalog or speak with a counselor for more information.

<sup>2</sup> 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

### 2-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/stdntsrvcounsel/Pages/ApptSchedule.aspx>) to create a customized education plan that fits your needs.

Note: Co-requisite MATH course (2 units) and/or substitute ENGL 101E (5 units) may be needed based on placement.

Course	Title	Units
<b>Fall Term 1</b>		
BIOT 110	Biotechnology I: Basic Lab Skills and Documentation	5
ENGL 101 or ENGL 101H	Reading and Composition or Reading and Composition - Honors	4
BIOT 107 or BIOT 108	Biotechnology: Transforming Society Through Biology or Intro to Biotechnology: Real World Biology Applications	3
<b>Units</b>		<b>12</b>
<b>Winter Term 1</b>		
MATH 165 or MATH 165H	Introductory Statistics or Introductory Statistics - Honors	4
<b>Units</b>		<b>4</b>
<b>Spring Term 1</b>		
BIOT 125	Quality and Regulatory Practices in Biotechnology	3
BIOT 150	Biotechnology II: Biomanufacturing and Quality Principles	4
ETHN 101 or ETHN 116	Introduction to Ethnic Studies or Introduction to Chicano/Latino Studies	3
ARCH 250 or ARCH 251 or ART 100 or ART 105 or ART 108 or ART 110 or ART 199 or ART 199H or DANC 102 or MUSE 113 or THEA 101 or THEA 101H	History of Architecture: Prehistory to Mannerism or History of Architecture: Baroque to the Present Day or Art History - Fundamentals of Global Art History or Art History - Topics in Contemporary Art or History of Photography or Introduction to the Visual Arts or Motion Picture Appreciation or Motion Picture Appreciation - Honors or History of Dance or History of Rock and Roll or Introduction to Theatre Arts or Introduction to Theatre Arts - Honors	3
<b>Units</b>		<b>13</b>

Course	Title	Units
<b>Summer Term 1</b>		
ENGL 104 or ENGL 104H	Argumentative Writing and Critical Thinking or Argumentative Writing and Critical Thinking - Honors	3
<b>Units</b>		<b>3</b>
<b>Fall Term 2</b>		
CHEM 103	College Chemistry I	5
SPCH 100 or SPCH 100H or SPCH 101 or SPCH 101H or SPCH 106	Interpersonal Communication or Interpersonal Communication - Honors or Public Address or Public Address - Honors or Small Group Communication	3
ANTH 210 or ANTH 210H or PSY 101 or PSY 101H or SOC 201 or SOC 201H	Introduction to Cultural Anthropology or Introduction to Cultural Anthropology - Honors or Introduction to Psychology or Introduction to Psychology - Honors or Introduction to Sociology or Introduction to Sociology - Honors	3
ENGL 290 or ENGL 293 or ENGL 293H or ENGL 298 or KIN 166 or PHIL 101 or SOC 130	Ethnic Voices in Film or Children's Literature or Children's Literature - Honors or Literature of the Bible or American Food And Culture: Global Origins, History, and Current Impacts or Great Religions of the World or Introduction to LGBTQ Studies	3
<b>Units</b>		<b>14</b>
<b>Winter Term 2</b>		
POLI 103 or POLI 103H	American Government and Politics or American Government and Politics - Honors	3
<b>Units</b>		<b>3</b>
<b>Spring Term 2</b>		
CHEM 104	College Chemistry II	5
ARCH 250 or ARCH 251 or ART 100 or ART 105 or ART 108 or ART 110 or ART 199 or ART 199H or DANC 102 or ENGL 290 or ENGL 293 or ENGL 293H or ENGL 298 or KIN 166 or MUSE 113 or PHIL 101 or SOC 130 or THEA 101 or THEA 101H	History of Architecture: Prehistory to Mannerism or History of Architecture: Baroque to the Present Day or Art History - Fundamentals of Global Art History or Art History - Topics in Contemporary Art or History of Photography or Introduction to the Visual Arts or Motion Picture Appreciation or Motion Picture Appreciation - Honors or History of Dance or Ethnic Voices in Film or Children's Literature or Children's Literature - Honors or Literature of the Bible or American Food And Culture: Global Origins, History, and Current Impacts or History of Rock and Roll or Great Religions of the World or Introduction to LGBTQ Studies or Introduction to Theatre Arts or Introduction to Theatre Arts - Honors	3
KIN 170 or KIN 171 or KIN 171H or KIN 173	Fitness for Life or Health and Wellness or Health and Wellness - Honors or Introduction to Nutrition	3
HIST 107 or HIST 107H or HIST 108 or HIST 108H or HIST 111 or HIST 112 or HIST 160	History of the United States before 1877 or History of the United States before 1877 - Honors or History of the United States since 1877 or History of the United States since 1877 - Honors or History of the African-Americans to 1876 or History of the African-Americans since 1876 or History of Women in the United States	3
<b>Units</b>		<b>14</b>
<b>Total Units</b>		<b>63</b>

## 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/stdntsrvc/ctcenter/Pages/ApptSchedule.aspx>) with a career counselor.

Note: Course selections may affect total unit value.