

Biotechnology, AS

Program Description

The Associate's Degree in Biotechnology will train students to harness cellular and molecular processes in living & non-living organisms to develop technologies and products that help improve lives and the health of the planet. Students accomplish this through an interdisciplinary study of relevant science disciplines, including the biological sciences, chemical sciences, and biotechnology. This program provides knowledge and experience through lecture and laboratories that immerses students in the biotechnology field's ever-evolving techniques, protocols, practices, and careers, qualifying them for entry-level positions in the biotechnology industry. Additionally, the program will prepare students to continue their education towards Utah Tech bachelor's degrees in Biology, Bioinformatics, Chemistry, or Biochemistry. Students will analyze and solve problems associated with biotechnology in medicine, agriculture, livestock, the environment and other related sectors. Local support for this program comes from the following local biotechnology companies, Soft Cell Biological Research, Soft Cell Laboratories, Intermountain- Precision Genomics, Red Mesa Science and Refining, Deseret Laboratories, and Gene Stat. These companies will provide internships, mentorship, and employment opportunities for students in the program. Ultimately, we see the program creating a pipeline for the local and regional biotechnology industry.

Program Curriculum

60 credits

Utah Tech General Education Requirements

All Utah Tech General Education requirements must be fulfilled. A previously earned degree may fulfill those requirements, but courses must be equivalent to Utah Tech's minimum General Education standards in American Institutions, English, and Mathematics.

Code	Title	Hours
General Education Core Requirements (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)		
	English	3-7
	Mathematics	3-5
	American Institutions	3-6
	Life Sciences	3-10
	Physical Sciences	3-5
	Fine Arts	3
	Literature/Humanities	3
	Social & Behavioral Sciences	3
	Exploration	3-5

Biotechnology Requirements

Code	Title	Hours
BIOL 1610 & BIOL 1615	Principles of Biology I (LS) and Principles of Biology I Lab (LAB)	5
BIOL 2060 & BIOL 2065	Principles of Microbiology and Principles of Microbiology Lab	4
BTEC 1010	Fundamentals of Biotechnology	3
BTEC 2010	DNA Methods and Analysis	2
BTEC 2020	Protein Purification and Analysis	2
BTEC 2030	Cell Culture Techniques	2
BTEC 2040	Advanced Nucleic Acids Laboratory	3
CHEM 1210 & CHEM 1215	Principles of Chemistry I (PS) and Principles of Chemistry I Lab (LAB)	5
MATH 1050	College Algebra / Pre-Calculus (MA) (or higher)	4

Graduation Requirements

1. Complete a minimum of 60 college-level credits (1000 and above).
2. Complete at least 20 semester hours of credits at Utah Tech for institutional residency.
3. Cumulative GPA of 2.0 or higher.

Graduation Plan

1st Year

Fall Semester	Hours Spring Semester	Hours
BIOL 1610 & BIOL 1615	5 BIOL 2060 & BIOL 2065	4
BTEC 1010	3 ENGL 2010	3
ENGL 1010	3 MATH 1050	4
SSC 1010	2 BTEC 2010	3
General Education (Fine Art) (catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)	3	
	16	14

2nd Year

Fall Semester	Hours Spring Semester	Hours
BTEC 2020	2 BTEC 2040	3
BTEC 2030	2 General Education (Literature/ Humanities) (catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)	3
General Education (Social/ Behavioral Sciences) (catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)	3 General Education (Exploration) (catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)	3
General Education (American Institutions) (catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)	3 Elective	4
Electives	3 BTEC 3020	2
CHEM 1210 & CHEM 1215	5	
	18	15

Total Hours 63

AS Biotechnology Program Learning Outcomes

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

1. Outline the foundational concepts of biotechnology including the central dogma of molecular biology, bioethics, industry and careers in biotechnology.
2. Apply laboratory techniques in DNA methods, cell culture, protein purification, protein analysis, advanced nucleic acid technologies and microbial culture.
3. Analyze scientific data and interpret results.
4. Integrate knowledge of biology in oral and written assignment.
5. Apply critical thinking to assess existing and emergent biotechnology techniques, protocols and discoveries.