

Biology - Biological Sciences Emphasis, BS

Program Description

This B.S. Biology emphasis is designed for students interested in graduate school and seeking a career in research or academia. Students can cater their studies in this degree in multiple areas of biology including, molecular, biochemical, physiological, evolutionary and organismal. It is also the best option for students looking to apply to Veterinary school.

Program Curriculum

120 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.

General Education Core Requirements (<https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext>)

Code	Title	Hours
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

Code	Title	Hours
Biology Core Requirements		
BIOL 1610 & BIOL 1615	Principles of Biology I (LS) and Principles of Biology I Lab (LAB)	5
BIOL 1620 & BIOL 1625	Principles of Biology II and Principles of Biology II Lab	5
BIOL 3010	Evolution	3
BIOL 3030	Principles of Genetics	3
Mathematics & Physical Science Requirements		
CHEM 1210 & CHEM 1215	Principles of Chemistry I (PS) and Principles of Chemistry I Lab (LAB)	5
CHEM 1220 & CHEM 1225	Principles of Chemistry II and Principles of Chemistry II Lab	5
CHEM 2310 & CHEM 2315	Organic Chemistry I and Organic Chemistry I Lab	5
CHEM 2320 & CHEM 2325	Organic Chemistry II and Organic Chemistry II Lab	5
Complete one (1) of the following series of courses:		
PHYS 2010 & PHYS 2015 & PHYS 2020 & PHYS 2025	College Physics I (PS) and College Physics I Lab and College Physics II and College Physics II Lab	10

or PHYS 2210 & PHYS 2215 & PHYS 2220 & PHYS 2225	Physics/Scientists Engineers I (PS) and Physics/Scientists Engineers I Lab and Physics/Scientists EngineersII and Physics/Scientists Engineers II Lab	
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Additional Biology Requirements

BIOL 3040 & BIOL 3045	General Ecology and General Ecology Lab	4
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BIOL 3150 & BIOL 3155	Biostatistics and the Scientific Method and Scientific Method and Experimental Design	4
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Pick one (1) of the following Technical Laboratory Courses

BTEC 2010	DNA Methods and Analysis	2
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BTEC 2020	Protein Purification and Analysis	2
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BTEC 2030	Cell Culture Techniques	2
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BTEC 2050	Zebrafish Maintenance & Methodology	2
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BIOL 2300	Fundamentals of Bioinformatics	2
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Complete one (1) of the following sets of courses:

BIOL 3450 & BIOL 3455	General Microbiology and General Microbiology Lab	4
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or BIOL 3550
& BIOL 3555

Eukaryotic Cell Biology
and Eukaryotic Cell Biology Lab

Complete one (1) of the following series of courses:

BIOL 3420	Advanced Human Physiology	3
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BIOL 4500 & BIOL 4505	Comparative Vertebrate Physiology and Comparative Vertebrate Physiology Lab	4
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or BIOL 4600
& BIOL 4605

Plant Physiology
and Plant Physiology Lab

Complete one (1) of the following sets of courses:

BIOL 3200
& BIOL 3205

Invertebrate Zoology
and Invertebrate Zoology Lab

BIOL 4260
& BIOL 4265

Herpetology
and Herpetology Lab

BIOL 4270
& BIOL 4275

Ichthyology
and Ichthyology Lab

BIOL 4280

Marine Biology

BIOL 4350
& BIOL 4355

Animal Behavior
and Animal Behavior Lab

BIOL 4380
& BIOL 4385

Ornithology
and Ornithology Lab

BIOL 4411
& BIOL 4415

Mammalogy
and Mammalogy Lab

BIOL 4440

General Entomology

Complete the following seminar course:

BIOL 4910	Senior Seminar	1
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Biology Electives

Complete 12 credits of upper-division BIOL or BTEC coursework not already used to fulfill another requirement. Courses from the following list may also be used to fulfill this requirement: 12

CHEM 3510
& CHEM 3515

Biochemistry I
and Biochemistry I Lab

CHEM 3520
& CHEM 3525

Biochemistry II
and Biochemistry II Lab

MATH 1210

Calculus I (MA)

Graduation Requirements

1. Complete a minimum of 120 college-level credits (1000 and above).
2. Complete at least 40 upper-division credits (3000 and above).
3. Complete at least 30 upper-division credits at Utah Tech for institutional residency.
4. Cumulative GPA 2.0 or higher.
5. Grade C- or higher required in each Program Requirement, Core Discipline Requirement, and Biology Elective Requirement course.
6. Maximum 6 total credits of BIOL 4810R, and/or BIOL 4890R, and/or BIOL 4930R may be used toward Biology requirements.

Graduation Plan

1st Year

Fall Semester	Hours Spring Semester	Hours
SSC 1010	2 BIOL 1620 & BIOL 1625	5
BIOL 1610 & BIOL 1615	5 CHEM 1210 & CHEM 1215	5
ENGL 1010	3 MATH 1060	3
MATH 1050	4	
	14	13

2nd Year

Fall Semester	Hours Spring Semester	Hours
BIOL 3030	3 BIOL 3010	3
CHEM 1220 & CHEM 1225	5 BIOL 3040 & BIOL 3045	4
ENGL 2010	3 CHEM 2310 & CHEM 2315	5
MATH 1210	4 General Education (American Institutions) (https:// catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)	
Technical Lab Course Choice		
	15	12

3rd Year

Fall Semester	Hours Spring Semester	Hours
CHEM 2320 & CHEM 2325	5 Eukaryotic/General Microbiology Choice	
PHYS 2010 & PHYS 2015	5 PHYS 2020 & PHYS 2025	5
General Elective	2 BIOL Upper Division Elective	4
BIOL 3150 & BIOL 3155	4 General Education (Social & Behavioral Sciences) (https://catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)	
General Education (Literature/ Humanities) (https:// catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)		
	16	9

4th Year

Fall Semester	Hours Spring Semester	Hours
Organismal Set or Series Choice	4 BIOL 4910	1
Physiology & Lab Choice	BIOL Uppper Division Electives	

BIOL Upper Division Electives	BIOL Upper Division Electives	2
Upper Division General Elective(s)	4 General Electives	
	General Elective	3
	8	6

Total Hours 93**Graduation Plan - MATH 1010****1st Year**

Fall Semester	Hours Spring Semester	Hours
BIOL 1610 & BIOL 1615	5 ENGL 2010	3
ENGL 1010	3 BIOL 1620 & BIOL 1625	5
MATH 1010	4 MATH 1050	4
BIOL 3030	3 General Education (Social & Behavioral Science) (https:// catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)	3
General Education (Fine Arts) (https://catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)	3	
	18	15

2nd Year

Fall Semester	Hours Spring Semester	Hours
CHEM 1210 & CHEM 1215	5 CHEM 1220 & CHEM 1225	5
MATH 1060	3 BIOL 3010	3
BIOL 3030	3 MATH 1210	4
General Education (Fine Arts) (https://catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)	3 General Education (American Institutions) (https:// catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)	3
	14	15

3rd Year

Fall Semester	Hours Spring Semester	Hours
CHEM 2310 & CHEM 2315	5 CHEM 2320 & CHEM 2325	5
PHYS 2010 & PHYS 2015	5 PHYS 2020 & PHYS 2025	5
BIOL 3040 & BIOL 3045	4 Organismal Course	4
	14	14

4th Year

Fall Semester	Hours Spring Semester	Hours
BIOL 4500 & BIOL 4505	4 Upper Division BIOL Elective	3
BIOL 3450 & BIOL 3455	4 BIOL 3150 & BIOL 3155	4
Upper Division BIOL Elective	3 BIOL 4910	1

General Education (Lit / Humanities) (https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3 Upper Division BIOL Elective	3
	Upper Division BIOL Elective	3
	14	14

Total Hours 118

BS Biological Sciences Program Learning Outcomes

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

1. Outline the foundational concepts of biology including cellular, organismal, ecological, and evolutionary biology.
2. Evaluate hypotheses, design research, test hypotheses, conduct data analysis, and draw conclusions on biology related problems.
3. Integrate knowledge of scientific literacy in oral and written assignments when communicating biological topics.
4. Evaluate information to discriminate between science and non-science.
5. Develop an understanding of why science is an integral activity for addressing social and environmental problems.