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 (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	Physics/Scientists Engineers I (PS)	
& PHYS 2215	and Physics/Scientists Engineers I Lab	
& PHYS 2220	and Physics/Scientists EngineersII	
& PHYS 2225	and Physics/Scientists Engineers II Lab	
Additional Biology Requirements		
BIOL 3040	General Ecology	4
& BIOL 3045	and General Ecology Lab	
BIOL 3150	Biostatistics and the Scientific Method	4
& BIOL 3155	and Scientific Method and Experimental Design	
Pick one (1) of the following Technical Laboratory Courses		
BTEC 2010	DNA Methods and Analysis	2
BTEC 2020	Protein Purification and Analysis	2
BTEC 2030	Cell Culture Techniques	2
BTEC 2050	Zebrafish Maintenance & Methodology	2
BIOL 2300	Fundamentals of Bioinformatics	2
Complete one (1) of the following sets of courses:		
BIOL 3450	General Microbiology	4
& BIOL 3455	and General Microbiology Lab	
or BIOL 3550	Eukaryotic Cell Biology	
& BIOL 3555	and Eukaryotic Cell Biology Lab	
Complete one (1) of the following series of courses:		
BIOL 3420	Advanced Human Physiology	3
BIOL 4500	Comparative Vertebrate Physiology	4
& BIOL 4505	and Comparative Vertebrate Physiology Lab	
or BIOL 4600	Plant Physiology	
& BIOL 4605	and Plant Physiology Lab	
Complete one (1) of the following sets of courses:		
BIOL 3200	Invertebrate Zoology	
& BIOL 3205	and Invertebrate Zoology Lab	
BIOL 4260	Herpetology	
& BIOL 4265	and Herpetology Lab	
BIOL 4270	Ichthyology	
& BIOL 4275	and Ichthyology Lab	
BIOL 4280	Marine Biology	
BIOL 4350	Animal Behavior	
& BIOL 4355	and Animal Behavior Lab	
BIOL 4380	Ornithology	
& BIOL 4385	and Ornithology Lab	
BIOL 4411	Mammalogy	
& BIOL 4415	and Mammalogy Lab	
BIOL 4440	General Entomology	
Complete the following seminar course:		
BIOL 4910	Senior Seminar	1
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	Biochemistry I	
& CHEM 3515	and Biochemistry I Lab	
CHEM 3520	Biochemistry II	
& CHEM 3525	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) (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) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	
General Education (Literature/Humanities) (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 Uppper 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) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
General Education (Fine Arts) (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) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3	General Education (American Institutions) (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) (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.