Biology - Natural Sciences Emphasis, BS

Program Description

The B.S. Biology Natural Science emphasis is designed for students seeking a career in Organismal or Field Biology. This includes careers with the Bureau of Land Management (BLM), U.S. Forest Services, Fish and Game, National Parks Services, State Parks, Department of Natural Resources (DNR), Association of Zoos and Aquariums (AZA) and Local Governments.

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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td></td>
<td>General Education Core Requirements ([catalog.dixie.edu/programs/generaleducation/#gerequirementstext])</td>
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<tr>
<td></td>
<td>English</td>
<td>3-7</td>
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<tr>
<td></td>
<td>Mathematics</td>
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<td>American Institutions</td>
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<tr>
<td></td>
<td>Life Sciences</td>
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<tr>
<td></td>
<td>Physical Sciences</td>
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<td>Laboratory Science</td>
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<tr>
<td></td>
<td>Fine Arts</td>
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<td>Literature/Humanities</td>
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<td></td>
<td>Social &amp; Behavioral Sciences</td>
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<td>Exploration</td>
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<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>BIOL 1610 &amp; BIOL 1615</td>
<td>Principles of Biology I (LS) and Principles of Biology I Lab (LAB)</td>
<td>5</td>
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<tr>
<td>BIOL 1620 &amp; BIOL 1625</td>
<td>Principles of Biology II and Principles of Biology II Lab</td>
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<tr>
<td>BIOL 2400 &amp; BIOL 2405</td>
<td>Plant Kingdom (LS, ALPP) and Plant Kingdom Lab (LAB, ALPP)</td>
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<tr>
<td>BIOL 3010</td>
<td>Evolution</td>
<td>3</td>
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<tr>
<td>BIOL 3030</td>
<td>Principles of Genetics</td>
<td>4</td>
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<tr>
<td>BIOL 3040 &amp; BIOL 3045</td>
<td>General Ecology and General Ecology Lab</td>
<td>4</td>
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<tr>
<td>BIOL 3110 or BIOL 3120</td>
<td>Scientific Writing and Science Communication</td>
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<tr>
<td>BIOL 4910</td>
<td>Senior Seminar</td>
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<tr>
<td>CHEM 1210 &amp; CHEM 1215</td>
<td>Principles of Chemistry I (PS) and Principles of Chemistry I Lab (LAB)</td>
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<td>CHEM 1220 &amp; CHEM 1225</td>
<td>Principles of Chemistry II and Principles of Chemistry II Lab</td>
<td>5</td>
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<tr>
<td>ENVS 1210 &amp; ENVS 1215</td>
<td>Introduction to Environmental Science and Introduction to Environmental Science Laboratory</td>
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</table>
GEO 1110 & GEO 1115

Physical Geology (PS)
and Physical Geology Lab (LAB)

GEOG 3600 & GEOG 3605

Introduction to Geographic Information Systems
and Introduction to Geographic Information Systems Laboratory

MATH 1040

Introduction to Statistics (MA)

or MATH 1050

College Algebra / Pre-Calculus (MA)

PHYS 1010 & PHYS 1015

Elementary Physics (PS)
and Elementary Physics Lab (LAB)

or PHYS 2010 & PHYS 2015

College Physics I (PS)
and College Physics I Lab (LAB)

Additional Biology Requirements

Complete three (3) of the following sets of courses:

- BIOL 3200 & BIOL 3205
  Invertebrate Zoology
  and Invertebrate Zoology Lab

- BIOL 3340 & BIOL 3345
  Plant Anatomy
  and Plant Anatomy Lab

- BIOL 4200 & BIOL 4205
  Plant Taxonomy (ALPP)
  and Plant Taxonomy Lab (ALPP)

- 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

- BIOL 4600 & BIOL 4605
  Plant Physiology
  and Plant Physiology Lab

Elective Courses

Complete 12 credits from the following or from any upper-division BIOL course listed above not already used to fulfill a requirement.

- BIOL 3100
  Bioethics

- BIOL 3140 & BIOL 3145
  Comparative Vertebrate Anatomy
  and Comparative Vertebrate Anatomy Lab

- BIOL 3250
  Cancer Biology

- BIOL 3340 & BIOL 3345
  Plant Anatomy
  and Plant Anatomy Lab

- BIOL 3360
  Developmental Biology

- BIOL 3450 & BIOL 3455
  General Microbiology
  and General Microbiology Lab

- BIOL 3550 & BIOL 3555
  Eukaryotic Cell Biology
  and Eukaryotic Cell Biology Lab

- BIOL 4300 & BIOL 4305
  Molecular Biology
  and Molecular Biology Laboratory

- BIOL 4500 & BIOL 4505
  Comparative Vertebrate Physiology
  and Comparative Vertebrate Physiology Lab

- BIOL 4810R
  Independent Research

- BIOL 4930R
  Senior Thesis

- GEOG 4140
  Advanced GIS Analysis

- GEOG 4180
  Geoprocessing with Python

- 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 (not C-) 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
- BIOL 1610 Principles of Biology I (LS) 5
- BIOL 1615 and Principles of Biology I Lab (LAB)
- ENGL 1010 Introduction to Writing (EN) 3
- CHEM 1210 Principles of Chemistry I (PS) 5
- & CHEM 1215 and Principles of Chemistry I Lab (LAB)
- SSC 1010 Trailblazer Connections 2

Spring Semester
- BIOL 1620 Principles of Biology II 5
- & BIOL 1625 and Principles of Biology II Lab
- MATH 1050 College Algebra / Pre-Calculus (MA) 4
- CHEM 1220 Principles of Chemistry II 5
- & CHEM 1225 and Principles of Chemistry II Lab

Hours 15

2nd Year
Fall Semester
- BIOL 2400 Plant Kingdom (LS, ALPP) 4
- BIOL 2405 and Plant Kingdom Lab (LAB, ALPP) (meets GE Exploration requirement)
- BIOL 3030 Principles of Genetics 4
- ENGL 2010 Interm Writing Selected Topics: (EN) 3
- General Elective 3

Hours 14

Spring Semester
- BIOL 3040 General Ecology 4
- & BIOL 3045 and General Ecology Lab
- GEOG 3600 Introduction to Geographic Information Systems 4
- & GEOG 3605 and Introduction to Geographic Information Systems Laboratory

Hours 17
Biology - Natural Sciences Emphasis, BS

BIOL 3120  Science Communication  3  
or BIOL 3110  or Scientific Writing  
General Education (Fine Arts) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)  3  

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Spring Semester
BIOL electives  3  
BIOL organismal course #2  4  
Additional Physical Sciences course  3  
General Elective(s)  6  

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4th Year

Fall Semester
GEO 1110  Physical Geology (PS)  4  
& GEO 1115  and Physical Geology Lab (LAB)  
BIOL electives  4  
General Education (American Institutions) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)  3  
BIOL organismal course #3  4  

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Spring Semester
BIOL Upper Division electives  5  
BIOL 4910  Senior Seminar  1  
General Education (Literature / Humanities) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)  3  
Upper Division Electives  6  

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<th>Total Hours</th>
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Natural 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, organismic, 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.