

Biology - Integrated Science Biology Education, BS

Program Description

The B.S. Biology Secondary Education with Integrated Science emphasis is designed for students seeking a career in secondary education. Successful completion of this degree, the secondary education program and the required PRAXIS exams, allows students to obtain the Biological Sciences and the Mid-Level Science endorsement. This certifies the student to teach high school biology and 7th & 8th grade science.

Professional Licensure/Certification (PLC) Requirements

The curriculum for programs at Utah Tech University leading to professional licensure are designed to prepare students for Utah licensure and certification requirements. Admission into programs for professions requiring licensure and certification does not guarantee that students will obtain a license or certificate. Licensure and certification requirements are set by agencies that are not controlled by or affiliated with the University, and licensure and certification requirements can change at any time.

Licensure boards in each state establish requirements for licensure and certification for their respective state. States vary by which professions are required to be licensed and how licensure functions, and such requirements may change at any time. The terms related to licensure and certification, among others, also vary by state as well.

Students and prospective students are strongly encouraged to contact the state licensure entity in the state where they intend to work to review all licensure and certification requirements imposed by the student's state(s) of choice. The University cannot provide verification of a student's ability to meet licensure or certification requirements unrelated to its educational programming. Some states require individuals to complete additional requirements that are unrelated to educational prerequisites. For more information, visit the State Authorization and Professional Licensure (<https://academics.dixie.edu/state-authorization/>) web page and select the program, or speak to the director of the program.

Utah Tech University shall not be held liable if a student is unable to qualify for licensure or certification in any jurisdiction.

This disclosure is made pursuant to 34 CFR §668.43(a)(5)(v)(C).

Program Curriculum

135-139 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
	Laboratory Science	0-1
	Fine Arts	3
	Literature/Humanities	3
	Social & Behavioral Sciences	3
	Exploration	3-5
Code	Title	Hours
Complete one of the following American Institutions GE course (Secondary Education requirement):		
HIST 1700 or POLS 1100	American History (AI) American Government (AI)	3
Complete one of the following Social & Behavioral Sciences GE courses (Secondary Education requirement):		
FSDH 1500	Human Development Lifespan (SS, GC)	3

or PSY 1010	General Psychology (SS, GC)	
or PSY 1100	Human Development Through Lifespan (SS, GC)	
Code	Title	Hours
Biology Program 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
PHYS 2010 & PHYS 2015	College Physics I (PS) and College Physics I Lab (LAB)	5
MATH 1050 & MATH 1060 or MATH 1080	College Algebra / Pre-Calculus (MA) and Trigonometry (MA) Pre-Calculus with Trigonometry (MA)	5-7
Discipline 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 2320 & BIOL 2325 or BIOL 3140 & BIOL 3145	Human Anatomy and Human Anatomy Lab Comparative Vertebrate Anatomy and Comparative Vertebrate Anatomy Lab	4-5
BIOL 2420 & BIOL 2425 or BIOL 4500 & BIOL 4505	Human Physiology and Human Physiology Lab Comparative Vertebrate Physiology and Comparative Vertebrate Physiology Lab	4
BIOL 3010	Evolution	3
BIOL 3030	Principles of Genetics	4
BIOL 3040	General Ecology	3
BIOL 3045	General Ecology Lab	1
Complete one of the following sets of courses:		
BIOL 2060 & BIOL 2065 or BIOL 3450 & BIOL 3455 or BIOL 3550 & BIOL 3555	Principles of Microbiology and Principles of Microbiology Lab General Microbiology and General Microbiology Lab Eukaryotic Cell Biology and Eukaryotic Cell Biology Lab	
Required Biology Elective		
BIOL 2400 & BIOL 2405	Plant Kingdom (LS, ALPP) and Plant Kingdom Lab (LAB, ALPP)	4
Complete one of the following sets of Zoology 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 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	
Integrated Science Requirements		

GEO 1110 & GEO 1115	Physical Geology (PS) and Physical Geology Lab (LAB)	4
GEOG 1020 & GEOG 1025	Introduction to Weather (PS) and Introduction to Weather Lab (LAB)	4
PHYS 1040 & PHYS 1045	Elementary Astronomy (PS) and Elementary Astronomy Lab (LAB)	4

Lab Safety Requirement

SCI 2600	Lab Safety for Teachers	1
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Secondary Education Program Prerequisite Courses

EDUC 1010	Foundations/Intro to Education	3
EDUC 2010	Intro to Exceptional Learners	3
EDUC 2400	Foundations Multicultural/ESL (SS, GC, ALCI)	3
EDUC 2500	Instructional Technology in K-12 Classrooms	3
EDUC 3110	Educational Psychology	3

Secondary Education Program Admission

To be admitted to the Secondary Education Program and enroll in professional courses:

- USBE R277-504-3 A(3) "requires candidates to maintain a cumulative university GPA of 3.0, and receive a C or better in all education related courses and major required content courses"

and students must pass the appropriate PRAXIS II content area subject test(s). In addition, one of the following must be completed:

- Students with BA/BS degrees in progress must have completed at least 95% of major coursework and have approval of major academic content area department advisor
- Students with completed BA/BS or higher degrees must have their transcripts reviewed by content area department advisor

Secondary Education Program Professional Requirements

Code	Title	Hours
Semester I		
SCI 4700	Secondary Science Teaching Methods	3
SCED 3720	Reading Writing Content Areas (ALPP)	2
SCED 4100	Curriculum and Instruction	3
SCED 4200	Secondary Assessment	2
SCED 4600	Classroom Management (ALPP)	3
SCED 4300	Practicum Seminar	3
Semester II		
SCED 4900	Secondary Student Teaching	10
SCED 4989	Student Teaching Capstone	3

Graduation Requirements

1. Complete a minimum of 135 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 university GPA 3.0 or higher.
5. Grade C or higher (not C-) in each Biology Program Requirement, Core Discipline Requirement, and Biology Elective course.
6. USBE R277-504-3 A(3) "requires candidates to maintain a cumulative university GPA of 3.0, and receive a C or better in all education related courses and major required content courses"
7. 3.0 GPA in program prerequisite and professional courses.

Graduation Plan - 5 years

1st Year

Fall Semester	Hours	Spring Semester	Hours
BIOL 1610 & BIOL 1615		5 BIOL 1620 & BIOL 1625	5
EDUC 1010		3 ENGL 1010	3
CHEM 1210 & CHEM 1215		5 FSHD 1500, PSY 1010, or PSY 1100	3
		General Education (Fine Arts) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
		13	14

2nd Year

Fall Semester	Hours	Spring Semester	Hours
CHEM 1220 & CHEM 1225		5 HIST 1700 or POLS 1100	3
BIOL 2320 & BIOL 2325		5 MATH 1080	5
ENGL 2010		3 BIOL 2420 & BIOL 2425	4
		EDUC 2010	3
		13	15

3rd Year

Fall Semester	Hours	Spring Semester	Hours
BIOL 3010		3 BIOL 2060 & BIOL 2065	4
BIOL 3030		4 GEO 1110 & GEO 1115	4
EDUC 2400		3 SCI 2600	1
PHYS 1040 & PHYS 1045		4 General Education (Literature & Humanities) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
		14	12

4th Year

Fall Semester	Hours	Spring Semester	Hours
BIOL 2400 & BIOL 2405		4 BIOL 3040 & BIOL 3045	4
PHYS 2010 & PHYS 2015		5 EDUC 3110	3
EDUC 2500		3 GEOG 1020 & GEOG 1025	4
EDUC 3110		3 BIOL Requirement (Approved Zoology Course)	2-4
		15	13-15

5th Year

Fall Semester	Hours	Spring Semester	Hours
SCED 3720		2 SCED 4900	10
SCED 4100		3 SCED 4989	3
SCED 4200		2	
SCED 4300		3	
SCED 4600		3	

SCI 4700	3	
	16	13

Total Hours 138-140**Graduation Plan - 4 year****1st Year**

Fall Semester	Hours	Spring Semester	Hours
BIOL 1610 & BIOL 1615 (meets General Education - Life Sciences)		5 BIOL 1620 & BIOL 1625	5
CHEM 1210 & CHEM 1215 (meets General Education - Physical Sciences)		5 CHEM 1220 & CHEM 1225	5
EDUC 1010 General Education (Fine Arts)		3 ENGL 1010	3
		3 BIOL 2320 & BIOL 2325	5
FSHD 1500, PSY 1010, or PSY 1100		3	
		19	18

2nd Year

Fall Semester	Hours	Spring Semester	Hours
ENGL 2010		3 BIOL 2420 & BIOL 2425	4
MATH 1080		5 EDUC 2400	3
BIOL 3010		3 EDUC 2010	3
BIOL 3030		4 PHYS 1040 & PHYS 1045	4
HIST 1700 or POLS 1100		3 BIOL 2060 & BIOL 2065	4
		18	18

3rd Year

Fall Semester	Hours	Spring Semester	Hours
BIOL 2400 & BIOL 2405		4 EDUC 2500	3
BIOL 3040 & BIOL 3045		4 EDUC 3110	3
GEO 1110 & GEO 1115		4 PHYS 2010 & PHYS 2015	5
SCI 2600		1 GEOG 1020 & GEOG 1025	4
General Education (Literature & Humanities) (catalog.utahtech.edu/ programs/generaleducation/ #gerequirementstext)		3 BIOL Requirement (Approved Zoology Course)	2-4
		16	17-19

4th Year

Fall Semester	Hours	Spring Semester	Hours
SCED 3720		2 SCED 4900	10
SCED 4100		3 SCED 4989	3
SCED 4600		3	
SCI 4700		3	
SCED 4200		2	

SCED 4300	3	
	16	13

Total Hours 135-137

¹ Specific courses fulfill SET requirements

Biology with Integrated Science 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. Develop an understanding of why science is an integral activity for addressing social and environmental problems.
5. Analyze evidence to continually reflect on and adapt practices to meet the needs of K-12 learners.