BIOLOGY, BACHELOR OF ARTS (BA) - PRE-MASTER OF EDUCATION (7-12)

Students seeking state certification in secondary education must also complete requirements for a Master of Education degree, a one-year program at SRU. All of our programs are designed to steadily develop the quantitative, deductive and inductive reasoning skills that biologists must have.

All candidates completing this program and student teaching are eligible to receive Pennsylvania certification after achieving a passing or qualifying score on Pennsylvania Department of Education required exam(s). If you are interested in teaching in another state, please contact the Department of Education in that state.

Requirements for the Certification

Teacher certification is earned through the master of education degree at Slippery Rock University. Students seeking secondary school teaching certification in biology must earn a bachelor of arts or a bachelor of science degree in biology and contact the Department of Secondary Education/Foundations of Education concerning its graduate program in education. Information about this program, including prerequisites for admission, may be obtained from the Secondary Education/Foundations of Education office in 114 McKay Education Building.

PROGRAM LEARNING OUTCOMES

- **Competence in Laboratory and Research Skills: To conduct, assess, and communicate research investigations using established scientific practices.** (SRU UG 1, 2, 3, 4, 5, 7 10)
- **Core Concepts for Biological Literacy:** (SRU UG 1, 2, 3, 4, 5, 7, 9)
  - Knowledge/Content
    - Evolution
    - Structure and function across all levels of biological organization
    - Diversity and interactions of life
    - Information flow, exchange and storage in biological systems
  - Critical Thinking/Problem Solving
    - Connect information from cognate science courses and liberal arts courses to biological concepts
    - Apply scientific information to current and future societal problems
- **Participation in Diverse, Enriching Scientific Activities:** Apply technical and professional skills in hands-on laboratory, clinical or field experiences. (SRU UG 1, 2, 3, 4, 5, 7, 8, 9)
- **Professional Attitude:** Graduates demonstrate professional attitude, behavior, and ability to interact with people from diverse backgrounds and cultures. (SRU UG 1, 5, 7, 8, 9)

Related Links

Biology - Pre-Masters of Education, BA Program Page (https://www.sru.edu/academics/majors-and-minors/biology-pre-masters-of-education/)

Professional Licensure/Certification Page (https://www.sru.edu/students/student-consumer-information/professional-licensures/)

Curriculum Guide

GPA Requirement

Major GPA: 2.0 or higher
Overall GPA: 2.0 or higher
Core GPA: 2.0 or higher

Summary*

Code	Title	Hours
Rock Studies 2 Requirements		45
Modern Language Requirement		0-9
Major/Concentration Requirements		42
Natural Science and Math College-Wide Requirements		12
Electives		25

* All undergraduate degree programs require a minimum of 120 credits. Some courses meet multiple requirements, but are only counted once toward the 120 credit total required to graduate.

Rock Studies 2 Requirements

Code	Title	Hours
The Rock		
SUBJ 139	Foundations of Academic Discovery [1]	3
ENGL 102	Critical Writing	3
ENGL 104	Critical Reading	3
MATH 125	Precalculus	4
or MATH 225	Calculus I	
Select one of the following:		3
COMM 200	Civil Discourse: Theory & Practice	
PHIL 110	Ethics and Civil Discourse	
POLI 235	Civil Discourse and Democracy	
Subtotal		16
Integrated Inquiry		
Creative and Aesthetic Inquiry		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Humanities Inquiry		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Social Science Inquiry		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Natural Sciences Inquiry		
CHEM 107	General Chemistry I	3
CHEM 111	General Chemistry I Lab	1
Physical Sciences Inquiry		
PHYS 201	Elements of Physics I with Lab	4
or PHYS 216	University Physics 1 with Lab	
Subtotal		17
Thematic Thread		

Select 12 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/) [2]	12
Total Hours	**45**

[1] Course offered in multiple subjects; cannot take course in first major subject.

[2] One course from each category; six credits must be 300-level or above; no more than 4 credits from one subject area; specific courses required in first major, regardless of prefix of course, cannot be used to satisfy thread requirements; any course with same prefix as first major cannot be used to satisfy thread requirements, even if it is not a course in the first major.

BA Modern Language Requirement

BA degree requires language proficiency at the 103 class level. Exemption by placement or examination is possible.

Code	Title	Hours
Complete 0-9 credits		0-9
Total Hours		**0-9**

DIVERSITY, EQUITY, AND INCLUSION REQUIREMENT

Students must take and pass a course with the Diversity, Equity, and Inclusion (DEI) designation prior to graduation. Students can meet this requirement by taking any DEI - designated course in any program at any time during their undergraduate career.

Major/Concentration Requirements

- 20 major credits must be taken at SRU or PASSHE
- 20 major credits must be taken at the 300 level or above
- Students desiring a Biology Major must maintain at least a 2.000 average in Biology.
- Students should complete all 200-level Biology requirements by the end of their sophomore year.
- Students must earn a "C" or better in both Biology I with Lab (BIOL 113) and Biology II with Lab (BIOL 114) before proceeding to their next biology course.
- Students must earn a "C" or better in both Genetics with Lab (BIOL 250) and Biometry with Lab (BIOL 325) prior to graduating.

Code	Title	Hours
Biology Core Requirements		
BIOL 113	Biology I: Foundations of Ecology, Evolution and Diversity with Lab	4
BIOL 114	Biology II: Foundations of Molecules, Genes and Cells with Lab	4
BIOL 250	Genetics with Lab [1,4]	4
BIOL 325	Biostatistics and Experimental Design with Lab	3
Subtotal		15
Required Upper-Level Biology		
BIOL 305	Wetlands and Aquatic Plants/Lab	3
or BIOL 306	Freshwater Biomonitoring/Lab	
or BIOL 401	Ecology with Lab	
BIOL 310	Plant Diversity with Lab	3
or BIOL 312	Zoology with Lab	
or BIOL 314	Parasitology with Lab	
or BIOL 330	Microbiology/Lab	
or BIOL 340	Vertebrate Anatomy with Lab	
or BIOL 360	Field Botany	
or BIOL 410	Animal Physiology with Lab	
or BIOL 451	Plant Physiology/Lab	
BIOL 316	Immunology with Lab	3
or BIOL 335	Cell Biology	
or BIOL 370	Molecular Biology	
BIOL 350	Evolution	3
BIOL 492	Biology Seminar [1]	1
Subtotal		13
Additional Biology Electives		
Select 3 credits from courses not chosen above, or any biology elective course listed below. Additional electives may be selected from the Marine Science offerings listed below. PLE courses are only offered during the summer months through our affiliation with Pymatuning Laboratory of Ecology. [2]		3
Upper-Level Electives (p. 3)		
Subtotal		3
Related Sciences – Chemistry		
CHEM 108	General Chemistry II [2]	3
CHEM 112	General Chemistry II Lab [2]	1
CHEM 201	Organic Chemistry I [2]	3
CHEM 211	Organic Chemistry Laboratory I [2]	1
Subtotal		8
Independent Study/Internship Options		
Select one of the following options:		3
Independent Study or Internship Option		
BIOL 450	Biology Internship	
or BIOL 490	Independent Study	
Non-Independent Study or Internship Option		
Select 3 credits, not chosen above, from Additional Biology Electives below.		
Total Hours		**42**

[1] Course counts for 50% of Major and Major GPA

[2] Course counts for 50% of Major requirements but not for Major GPA

[3] Course counts in Core GPA

* Some courses may require pre-requisites. Please see course descriptions to determine if there are any pre-requisites for that specific course.

Recommended Courses for Biology Pre-Masters in Education Courses

Listed below are the recommended courses for Biology Pre-Masters of Education majors. You will need to take these courses prior to obtaining your M. Ed.

Code	Title	Hours
SEFE 338	Standards-Based Instruction & Assessment in the Inclusionary Classroom	3
SPED 121	Overview of Special Education	3
One EGEO with Lab		3
Two Math courses (one must be Calculus)		6

Must take the following as part of your upper class Biology Electives:

BIOL 370	Molecular Biology
BIOL 401	Ecology with Lab
BIOL 410	Animal Physiology with Lab

Natural Science and Math College-Wide Requirements

Code	Title	Hours
CHEM 107	General Chemistry I	3
CHEM 111	General Chemistry I Lab	1
MATH 125	Precalculus	4
or MATH 225	Calculus I	
PHYS 201	Elements of Physics I with Lab	4
or PHYS 211	General Physics I with Lab	
Total Hours		**12**

Electives

Code	Title	Hours
Recommended by the Biology Department		
CHEM 304	Organic Chemistry II	3
CHEM 314	Organic Chemistry Laboratory II	1

Additional Upper-Level Biology Electives

Code	Title	Hours
BIOL 209	Advanced Human Anatomy and Physiology I with Laboratory	4
BIOL 301	Forest Ecology [1]	3
BIOL 302	Ecology of Amphibians & Reptiles/Lab [1]	3
BIOL 303	Behavioral Ecology/Lab [1]	3
BIOL 305	Wetlands and Aquatic Plants/Lab [1]	3
BIOL 306	Freshwater Biomonitoring/Lab [1]	3
BIOL 307	Vertebrate Ecology/Lab [1]	3
BIOL 308	Aquatic Ecosystem Management / Lab [1]	3
BIOL 309	Advanced Human Anatomy and Physiology II with Laboratory	4
BIOL 310	Plant Diversity with Lab [1]	3
BIOL 311	Entomology/Lab [1]	3
BIOL 312	Zoology with Lab	3
BIOL 313	Herpetology/Lab [1]	3
BIOL 314	Parasitology with Lab [1]	3
BIOL 316	Immunology with Lab [1]	3
BIOL 317	Ecology and Fungi [1]	3
BIOL 320	Ornithology/Lab [1]	3
BIOL 321	Wildlife Management/Lab [1]	3
BIOL 322	Conservation Biology/Lab [1]	3
BIOL 323	Stream Ecology/Lab [1]	3
BIOL 325	Biostatistics and Experimental Design with Lab [1]	3
BIOL 326	Field Methods in Biogeography/Lab [1]	3
BIOL 327	Limnology/Lab [1]	3
BIOL 330	Microbiology/Lab [1]	3
BIOL 331	Mammology/Lab [1]	3
BIOL 335	Cell Biology	3
BIOL 340	Vertebrate Anatomy with Lab	3
BIOL 343	Embryology with Lab [1]	3
BIOL 350	Evolution [1]	3
BIOL 356	Field Ecology / Lab [1]	3
BIOL 357	Environmental Microbiology with Lab [1]	4
BIOL 360	Field Botany [1]	3
BIOL 361	Flora of Western Pennsylvania [1]	3
BIOL 370	Molecular Biology [1]	3
BIOL 371	Vertebrate Field Zoology [1]	3
BIOL 373	Ichthyology/Lab [1]	3
BIOL 375	Ecology of Fish / Lab [1]	3
BIOL 380	Endocrinology	3
BIOL 395	Workshop	1-6
BIOL 398	Selected Topics	1-3
BIOL 400	Disease Ecology [1]	3
BIOL 401	Ecology with Lab [1]	3
BIOL 402	Biogeography/Lab [1]	3
BIOL 405	Animal Physiological Ecology with Lab [1]	4
BIOL 409	Pathophysiology	3
BIOL 410	Animal Physiology with Lab [1]	3
BIOL 412	Population Biology [1]	3
BIOL 430	Pathogenic Microbiology [1]	3
BIOL 435	Cellular and Molecular Analysis Laboratory	3
BIOL 450	Biology Internship [1]	3
BIOL 451	Plant Physiology/Lab [1]	3
BIOL 470	Histology with Lab [1]	3
BIOL 490	Independent Study	1-3
BIOL 495	Workshop	1-6
BIOL 498	Selected Topics [1]	3
MRSC 221	Marine Invertebrates [1]	3
MRSC 241	Marine Biology [1]	3
MRSC 250	Wetland Ecology [1]	3
MRSC 260	Marine Ecology [1]	3
MRSC 260	Marine Ecology	3
MRSC 270	Coastal Vegetation [1]	3
MRSC 298	Selected Topics [1]	1-3
MRSC 300	Behavior of Marine Organisms [1]	3
MRSC 310	The Mammals of Coastal Ecosystems [1]	3
MRSC 320	Marine Microbiology [1]	3
MRSC 330	Tropical Invertebrates [1]	3
MRSC 342	Marine Botany [1]	3
MRSC 343	Marine Ichthyology [1]	3
MRSC 344	Anatomy of Marine Chordates [1]	3
MRSC 345	Ornithology [1]	3
MRSC 345	Ornithology	3
MRSC 350	Physiology of Marine Invertebrates [1]	3
MRSC 398	Selected Topics [1]	1-3
MRSC 420	Marine Micropaleontology [1]	3
MRSC 431	Ecology of Marine Plankton [1]	3
MRSC 458	Exploration Methods in Marine Geology [1]	3
MRSC 490	Independent Study [1]	1-3
MRSC 491	Coral Reef Ecology [1]	3

MRSC 492	Marine Mammals [1]	3
MRSC 498	Selected Topics [1]	1-3
MRSC 500	Problems in Marine Science [2]	3

[1] Course counts for 50% of Major requirements and Major GPA

Co-Curricular and Experiential Learning

Students are encouraged to explore additional curricular and co-curricular opportunities. There is a strong correlation between long-term student success and participation in the following types of programs and activities:

1. Student-faculty research
2. Internships
3. Volunteering
4. Job Shadowing

Important Curriculum Guide Notes

This Curriculum Guide is provided to help SRU students and prospective students better understand their intended major curriculum. Enrolled SRU students should note that the My Rock Audit may place already-earned and/or in progress courses in different, yet valid, curriculum categories. Enrolled SRU students should use the My Rock Audit Report and materials and information provided by their faculty advisers to ensure accurate progress towards degree completion. *The information on this guide is current as of the date listed. Students are responsible for curriculum requirements at the time of enrollment at the University.*

PASSHE - Pennsylvania State System of Higher Education Institutions

BIOLOGY - BA (6 08) / CIM 71
w/ optional Pre Masters in Education (7-12) (PX)
This program is effective as of Summer 2023
Revised 09.18.2025
UCC 02.25.2025

Recommended Four-Year Plan

Course	Title	Hours
First Year		
Fall		
ENGL 102	Critical Writing	3
BIOL 113	Biology I: Foundations of Ecology, Evolution and Diversity with Lab	4
CHEM 107	General Chemistry I	3
CHEM 111	General Chemistry I Lab	1
ESAP 101	FYRST Seminar *	1
SUBJ 139	Foundations of Academic Discovery [1]	3
	Hours	**15**
Spring		
ENGL 104	Critical Reading	3
CHEM 108	General Chemistry II	3
CHEM 112	General Chemistry II Lab	1
BIOL 114	Biology II: Foundations of Molecules, Genes and Cells with Lab	4
Language 101		3
	Hours	**14**
Second Year		
Fall		
Select one of the following:		3
COMM 200	Civil Discourse: Theory & Practice	
PHIL 110	Ethics and Civil Discourse	
POLI 235	Civil Discourse and Democracy	
BIOL 250	Genetics with Lab	4
CHEM 201	Organic Chemistry I	3
CHEM 211	Organic Chemistry Laboratory I	1
Language 102		3
Declare a Thematic Thread [2]		
	Hours	**14**
Spring		
Language 103		3
BIOL 325	Biostatistics and Experimental Design with Lab	3
Creative & Aesthetic Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
MATH 125 or MATH 225	Precalculus or Calculus I	4
	Hours	**13**
Third Year		
Fall		
Humanities Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Social Science Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
BIOL 370	Molecular Biology [3]	3
SPED 121	Overview of Special Education	3
PHYS 201 or PHYS 211	Elements of Physics I with Lab or General Physics I with Lab	4
	Hours	**16**
Spring		
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
EGEO/Lab		3
BIOL 300+	Upper Level BIOL Elective	3
Free Elective		3
	Hours	**15**
Fourth Year		
Fall		
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
BIOL 401	Ecology with Lab	3
BIOL 410	Animal Physiology with Lab [3]	3
Free Elective		3
Free Elective		2
2nd Math Course		3
	Hours	**17**

Spring		
SEFE 338	Standards-Based Instruction & Assessment in the Inclusionary Classroom	3
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
BIOL 300+	Upper Level BIOL Elective	3
Free Elective		3
Free Elective		3
BIOL 492	Biology Seminar	1
	Hours	**16**
	Total Hours**	**120**

[1] Course offered in multiple subjects; cannot take course in first major subject.

[2] Work with your Academic Adviser to declare a Thematic Thread by the end of your fall semester in your second year.

[3] Recommended BIOL 300+ Upper Level Elective

* Students are encouraged to take ESAP 101 as a Free Elective.

***This document serves as a guide. Earning a degree requires at least 120 credits, though some majors require more. Before registering for courses, consult your academic adviser and review your curriculum guide. Be sure to review and confirm your plan with your adviser at least once each academic year.*

Major Code: 6 08
Concentration Code: PX
Revised date: 09.23.2025