

COMPUTING, BACHELOR OF SCIENCE (BS) - CONCENTRATION IN COMPUTER SCIENCE WITH CONCENTRATION IN BIOINFORMATICS

Program Learning Outcomes

- Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline
- Communicate effectively in a variety of professional contexts.
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

Related Links

Computing - Computer Science Bioinformatics, BS Program Page (<https://www.sru.edu/academics/majors-and-minors/computing-computer-science/>)

Computer Science Department Page (<https://www.sru.edu/academics/colleges-and-departments/ches/departments/computer-science/>)

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

Summary*

Code	Title	Hours
	Rock Studies 2 Requirements	44-45
	Other Basic Requirements	0-3
	Computer Competency	0-3
	Major/Concentration Requirements	54
	Bioinformatics Concentration Requirements	18
	Electives	22

* 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
Select one of the following:		3-4
MATH 125	Precalculus	
MATH 225	Calculus I	
MATH 230	Calculus II	
MATH 231	Calculus III	
STAT 152	Elementary Statistics I	
Select one of the following:		3
COMM 200	Civil Discourse: Theory & Practice	
PHIL 110	Ethics and Civil Discourse	
POLS 235	Civil Discourse and Democracy	
Subtotal		15-16
Integrated Inquiry		
<i>Creative and Aesthetic Inquiry</i>		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
<i>Humanities Inquiry</i>		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
<i>Social Science Inquiry</i>		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
<i>Physical and Natural Science Inquiry</i>		
Select one of the following:		4
BIOL 114	Biology II: Foundations of Molecules, Genes and Cells with Lab	
BIOL 101 & BIOL 100	General Biology and Introductory Biology Laboratory	
CHEM 107 & CHEM 111	General Chemistry I and General Chemistry I Lab	4
Subtotal		17
Thematic Thread		
Select 12 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/) ²		12
Total Hours		44-45

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.

Basic Math Requirement

Check with your adviser or a current degree audit report to see if you have been exempted from this course. The credit earned in this course will not be counted toward the 120 credit hour minimum needed to earn a degree.

Code	Title	Hours
Complete one of the following:		0-3
Meet required minimum SAT or ACT math score OR		
ESAP 110	Beginning Algebra	
Total Hours		0-3

Computer Competency

Code	Title	Hours
Demonstrate "computer competency" by one of the following:		0-3
Pass Computer Competency Exam OR		
Select one of the following at SRU or another post-secondary institution:		
CPSC 100	Introduction to Computing for Liberal Arts	
CPSC 110	Computer Concepts	
CPSC 130	Introduction to Computing and Programming	
PE 202	Technology for Wellness	
Total Hours		0-3

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

- 27 major credits must be taken at SRU or PASSHE
- 27 major credits must be taken at the 300 level or above

Code	Title	Hours
Required Core Courses		
CPSC 130	Introduction to Computing and Programming ¹	3
CPSC 146	Programming Principles ¹	3
CPSC 207	Shell Commands and Scripting ¹	3
CPSC 300	Challenges of Computer Technology ¹	3
or MIS 300	Challenges of Computer Technology	
CPSC 311	Discrete Computational Structures ¹	3
CPSC 323	Fundamentals of Database Systems ¹	3
or MIS 323	Data Base Systems	
CPSC 327	Administration and Security ¹	3
CPSC 423	Computer Networks ¹	3
STAT 152	Elementary Statistics I ¹	3
Subtotal		27
Computer Science Core Courses		
CPSC 246	Advanced Programming Principles ¹	3
CPSC 370	Computer Organization and Architecture ¹	3
CPSC 374	Algorithms and Data Structures ¹	3
CPSC 376	Programming Language and Theory ¹	3
CPSC 474	Advanced Architecture & Parallel Computing	3
CPSC 488	Software Engineering ¹	3
Subtotal		18
Computer Science Electives		

Select one of the following:		3
CPSC 217	Advanced Web Programming ¹	
CPSC 236	Selected Computer Languages	
CPSC 237	Mobile App Development for Smart Devices ¹	
CPSC 315	Internet of Things (IoT) ¹	
Select one of the following:		3
CPSC 405	Data Mining and Data Analysis ¹	
CPSC 476	Artificial Intelligence ¹	
Select one of the following:		3
CPSC 406	Data Visualization ¹	
CPSC 450	Internship ¹	
CPSC 456	Introduction to Computer Graphics ¹	
CPSC 478	Analysis of Algorithms	
CPSC 480	Topics in Computer Science: Machine Learning	
CPSC 485	Big Data Analytics ¹	
Subtotal		9
Total Hours		54

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

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

Bioinformatics Concentration

Code	Title	Hours
CHEM 201	Organic Chemistry I	3
BIOL 325	Biostatistics and Experimental Design with Lab	3
BIOL 335	Cell Biology	3
BIOL 370	Molecular Biology	3
CPSC 342	Introduction to Bioinformatics	3
CPSC 415	Advanced Bioinformatics	3
Total Hours		18

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. High-Impact Practice (HIP) designated classes (Learning Community, Cap-Stone Course, Semester Projects)
2. Student-faculty research
3. Service Learning Courses
4. Internships
5. Volunteering (Summer Day Camps, Semester Workshops for K-12 students, Robot demos for visitors/local school districts)
6. Industry Awareness Night

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

COMPUTING - BS (6420)

Concentration in Computer Science (642C)

w/optional Concentration in Bioinformatics (644C)

This program is effective as of Summer 2022

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