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

Program Learning Outcomes

- **Problem Solving and Critical Thinking:** Solve Problems by creating client/server applications that are efficient, user-friendly, and portable
  - Formulate project requirements and alternative solutions appropriate to the computing problems
  - Integrate design and implementation principles to develop effective applications
  - Perform critical analyses of the impacts of decisions based on mathematics
  - Implement computing solutions that consist of system and application software written in various programming languages
  - Create efficient, user-friendly applications appropriate to the computing problems
- **Communication and Interpersonal Skills:** Use written, oral and electronic methods for effective communication
  - Document all aspects of a system precisely and clearly
  - Use written, oral, and electronic communication to convey technical information effectively
  - Devise effective user interfaces based on the application
  - Work cooperatively in teams and with others
- **Ethical and Professional Responsibilities:** Discern and articulate the impact of technologies on society
  - Determine the economic and organizational effects of information technology on global society
  - Recognize important legal issues and demonstrate appropriate social responsibilities in information technology
  - Demonstrate an awareness of the codes of professional ethics in the information technology industry
  - Plan for and ensure the security, privacy, and integrity of data
  - Recognize the need for continuing professional development

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 Requirements		45
Other Basic Requirements		0-3
Computer Competency		0-3
Major/Concentration Requirements		54
Bioinformatics Concentration Requirements		18
Electives		21

* 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 Requirements

Code	Title	Hours
The Rock		
SUBJ 139	University Seminar [1]	3
ENGL 102	Critical Writing	3
ENGL 104	Critical Reading	3
MATH 125	Precalculus	4
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		16
Integrated Inquiry		
Creative and Aesthetic Inquiry		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
Humanities Inquiry		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
Social Science Inquiry		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
Physical and Natural Science Inquiry		
Select one of the following:		4
BIOL 104	Principles of Biology 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		**45**

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

2 From at least 3 categories; no more than 6 credits from one department; 6 credits must be 300-level or above.

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**

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 & 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	Biometry with Lab	3
BIOL 335	Cell Biology/Lab	3
BIOL 370	Molecular Biology with Lab	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 Fall 2019.
Revised 08.03.2021
UCC 2.5.2019