CYBERSECURITY, BACHELOR OF SCIENCE (BS) - CONCENTRATION IN SECURE SOFTWARE DEVELOPMENT

Program Learning Outcomes

- **Problem Solving and Critical Thinking**
  - Formulate project requirements and alternative solutions appropriate to the problem in a secure manner (UWO#2)
  - Integrate design and implementation principles to develop effective software without introduction of vulnerabilities (UWO#2)
  - Perform analyze software security and the efficiency of algorithms (UWO#4)
  - Implement solutions to computing problems written in various programming languages (UWO#2)
  - Use appropriate tools and techniques for identifying malware and other vulnerabilities (UWO#2)
- **Communication and Interpersonal Skills**
  - Document all aspects of secure software precisely and clearly (UWO#1)
  - Use written, oral, and electronic communication to convey technical information effectively (UWO#1)
  - Accurately communicate security analyses, policies, and methodologies (UWO#1)
  - Work cooperatively in teams and with others (UWO#5)
- **Ethical and Professional Responsibilities**
  - Determine the effects of security policy models in a global society (UWO#8)
  - Recognize the important legal and policy issues in the development of secure systems (UWO#10)
  - Demonstrate an awareness of the codes of professional ethics in the information technology industry (UWO#8)
  - Plan for and ensure the security, privacy, and integrity of data (UWO#10)
  - Recognize the need for continuing professional development (UWO#7)

Related Links

Cybersecurity - Secure Software Development, BS Program Page (https://www.sru.edu/academics/majors-and-minors/cybersecurity/)

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		43
Other Basic Requirements		0-3
Major Requirements		60
Electives		17

* 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:		4
MATH 125	Precalculus	
MATH 225	Calculus I	
MATH 230	Calculus II	
MATH 231	Calculus III	
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-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		
SCI 101	Science of Life	3
Physical Science Inquiry		
SCI 102	Understanding the Physical World	3
Subtotal		15
Thematic Thread		
Select 12 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/) [2]		12
Total Hours		**43**

[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**

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

- 30 major credits must be taken at SRU or PASSHE
- 30 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
CPSC 301	Practical Computer Security [1]	3
CPSC 311	Discrete Computational Structures [1]	3
CPSC 323	Fundamentals of Database Systems [1]	3
CPSC 327	Administration and Security [1]	3
CPSC 423	Computer Networks [1]	3
CYBR 101	Cybersecurity in the Era of Evolving Technology [1]	3
Subtotal		30
Secure Software Development Required Courses		
CPSC 246	Advanced Programming Principles [1]	3
CPSC 374	Algorithms and Data Structures [1]	3
CPSC 376	Programming Language and Theory [1]	3
CPSC 488	Software Engineering [1]	3
CYBR 301	Secure Programming	3
CYBR 353	Software Assurance [1]	3
CYBR 401	Software Security Analysis [1]	3
CYBR 471	Malware Analysis [1]	3
Subtotal		24
Secure Software Development Electives		
Select two of the following:		6
CPSC 236	Selected Computer Languages (the student is required to take CPSC 236: Selected Languages: Python) [1]	
CPSC 333	Introduction to Computer Forensics [1]	
CPSC 370	Computer Organization and Architecture [1]	
CPSC 450	Internship [1]	

Code	Title	Hours
CPSC 474	Advanced Architecture & Parallel Computing [1]	
CPSC 478	Analysis of Algorithms [1]	
CPSC 480	Topics in Computer Science: Machine Learning [1]	
Subtotal		6
Total Hours		**60**

[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.

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

CYBERSECURITY (6421)
Concentration in Secure Software Development (SSDE)
This program is effective as of Summer 2024
Revised 12.19.2023
UCC 11.28.2023

Recommended Four-Year Plan

Course	Title	Hours
First Year		
Fall		
CPSC 130	Introduction to Computing and Programming	3
CYBR 101	Cybersecurity in the Era of Evolving Technology	3
ENGL 102	Critical Writing	3
ESAP 101	FYRST Seminar *	1

MATH 120
  or SCI 101
	Intermediate Algebra
	  or Science of Life
		3

SUBJ 139	Foundations of Academic Discovery [1]	3
	Hours	**16**
Spring		
CPSC 146	Programming Principles	3
CPSC 301	Practical Computer Security	3
ENGL 104	Critical Reading	3
Select one of the following:		4
MATH 125	Precalculus	
MATH 225	Calculus I	
MATH 230	Calculus II	
MATH 231	Calculus III	
Select one of the following:		3
COMM 200	Civil Discourse: Theory & Practice	
PHIL 110	Ethics and Civil Discourse	
POLS 235	Civil Discourse and Democracy	
	Hours	**16**
Second Year		
Fall		
CPSC 207	Shell Commands and Scripting	3
CPSC 246	Advanced Programming Principles	3
SCI 101	Science of Life (or CE Elective)	3
Creative & Aesthetic 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
Declare a Thematic Thread [2]		
	Hours	**15**
Spring		
CPSC 323	Fundamentals of Database Systems	3
CYBR 301	Secure Programming	3
CPSC 300	Challenges of Computer Technology	3
SCI 102	Understanding the Physical World (or Cybersecurity Elective)	3
Humanities Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
	Hours	**15**
Third Year		
Fall		
CPSC 311	Discrete Computational Structures	3
CPSC 376	Programming Language and Theory	3
CYBR 353	Software Assurance	3
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Cyber Elective or Free Elective (p. 3)		3
	Hours	**15**
Spring		
CPSC 327	Administration and Security	3
CPSC 374	Algorithms and Data Structures	3
CYBR 401	Software Security Analysis	3
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3

Cyber Elective or Free Elective (p. 3)		3
	Hours	**15**
Fourth Year		
Fall		
CPSC 423	Computer Networks	3
CYBR 471	Malware Analysis	3
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Cyber Elective or Free Elective (p. 3)		3
Cyber Elective or Free Elective (p. 3)		3
	Hours	**15**
Spring		
CPSC 488	Software Engineering	3
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Cyber Elective or Free Elective (p. 3)		3
Cyber Elective or Free Elective (p. 3)		4
	Hours	**13**
	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.

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

Cyber Elective - CE Courses

Code	Title	Hours
Select six credits		
CPSC 333	Introduction to Computer Forensics	3
CPSC 370	Computer Organization and Architecture	3
CPSC 474	Advanced Architecture & Parallel Computing	3
CPSC 450	Internship [1]	1-12
CPSC 478	Analysis of Algorithms	3

[1] Jr. or Sr. Computing major with 3.0 GPA. Application required

** *This document is meant to serve as a guide. Some planners may show more than 120 credits because faculty have created flexibility in choosing courses. However, only 120 credits are required to obtain a degree. Please consult with your academic adviser and refer to your curriculum guide prior to registering for courses. This plan should be reviewed, and verified, by you and your academic adviser at least once each academic year.*

Major Code: 6421
Concentration: SSDE
Revised date: 06.10.2022