COMPUTING, BACHELOR OF SCIENCE (BS) - CONCENTRATION IN COMPUTING ANALYTICS

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 - Computing Analytics, BS Flowchart (https://www.sru.edu/documents/academics/departments/computer-science/course-flowchart-compsci-concentratin-computing-analytics.pdf)

Computing - Computing Analytics, BS Program Page (https://www.sru.edu/academics/majors-and-minors/computing-computing-analytics/)

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		43
Other Basic Requirements		0-3
Computer Competency		0-3
Major/Concentration Requirements		54
Electives		23

* 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
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-quick-guide/) [2]		12
Total Hours		**43**

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
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
STAT 152	Elementary Statistics I [1]	3
Subtotal		27
Computing Analytics Core Courses		
CPSC 246	Advanced Programming Principles [1]	3
CPSC 370	Computer Organization and Architecture	3
CPSC 374	Algorithms and Data Structures [1]	3
CPSC 405	Data Mining & Analysis [1]	3
CPSC 474	Advanced Architecture & Parallel Computing	3
CPSC 480	Topics in Computer Science: Machine Learning [1]	3
CPSC 485	Big Data Analytics [1]	3
Subtotal		21
Computer Science Electives		
Choose two from the following:		6
MATH 225	Calculus I	
CPSC 406	Data Visualization [1]	
CPSC 450	Internship [1]	
CPSC 456	Introduction to Computer Graphics [1]	
CPSC 476	Artificial Intelligence [1]	
CPSC 478	Analysis of Algorithms [1]	
Subtotal		6
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.

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 Computing Analytics (COAN)
This program is effective as of Fall 2019
Revised 09.13.2021
UCC 2.5.2019

Recommended Four-Year Plan

Course	Title	Hours
First Year		
Fall		
CPSC 130	Introduction to Computing and Programming	3
SUBJ 139	University Seminar [1]	3
INDS 101	FYRST Seminar	1
MATH 120 or SCI 101	Intermediate Algebra or Science of Life	3
ENGL 102	Critical Writing	3
Creative & Aesthetic Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
	Hours	**16**

Spring		
CPSC 146	Programming Principles	3
MATH 125	Precalculus	4
ENGL 104	Critical Reading	3
Select one of the following:		3
COMM 200	Civil Discourse: Theory & Practice	
PHIL 110	Ethics and Civil Discourse	
POLS 235	Civil Discourse and Democracy	
Social Science Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
	Hours	**16**
Second Year		
Fall		
CPSC 207	Shell Commands and Scripting	3
CPSC 246	Advanced Programming Principles	3
STAT 152	Elementary Statistics I	3
SCI 101	Science of Life (or CA Elective)	3
Computer Analytics Electives or Free Electives (p. 3)		3
Declare a Thematic Thread [2]		
	Hours	**15**
Spring		
CPSC 323	Fundamentals of Database Systems	3
CPSC 370	Computer Organization and Architecture	3
Humanities Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
SCI 102	Understanding the Physical World	3
Computer Analytics Electives or Free Electives (p. 3)		3
	Hours	**15**
Third Year		
Fall		
CPSC 311	Discrete Computational Structures	3
CPSC 300	Challenges of Computer Technology	3
CPSC 405	Data Mining & Analysis	3
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
Computer Analytics Electives or Free Electives (p. 3)		3
	Hours	**15**
Spring		
CPSC 327	Administration and Security	3
CPSC 374	Algorithms and Data Structures	3
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
Computer Analytics Electives or Free Electives (p. 3)		3
Computer Analytics Electives or Free Electives (p. 3)		3
	Hours	**15**
Fourth Year		
Fall		
CPSC 423	Computer Networks	3
CPSC 474	Advanced Architecture & Parallel Computing	3
CPSC 480	Topics in Computer Science: Machine Learning	3
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
Computer Analytics Elective or Free Elective		3
	Hours	**15**
Spring		
CPSC 485	Big Data Analytics	3
Thematic Thread Requirement (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/)		3
Computer Analytics Electives or Free Electives (p. 3)		3
Computer Analytics Electives or Free Electives (p. 3)		3
Computer Analytics Electives or Free Electives (p. 3)		3
	Hours	**15**
	Total Hours**	**122**

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. Click here (https://forms.office.com/Pages/ResponsePage.aspx?id=ul1VhjsH90-30bc6d8W9klM7Wtmwv-VJnD6riXkdMh1UNEFHMUNHOEI5TkJOWlRHVzRCMzI3UldNTi4u)to declare a thread.

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

Computer Analytics Elective Courses

Code	Title	Hours
Select six credits of the following:		6
CPSC 406	Data Visualization	
CPSC 450	Internship [1]	
CPSC 456	Introduction to Computer Graphics	
CPSC 476	Artificial Intelligence	
CPSC 478	Analysis of Algorithms	
MATH 225	Calculus I	

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

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

*** 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: 6420
Concentration Code: COAN
Revised date: 09.13.2021