COMPUTER SCIENCE (BS)

Exploration and Discovery

This program focuses on the design and development of software systems with an emphasis on the creation of new technology. Students will build a framework of conceptual knowledge and practical skills through core computer science courses. A broad selection of electives offers the opportunity to delve into several of the application areas of Computer Science. Auxiliary courses in mathematics and science develop additional analytical skills necessary for success in the many computing specialties that graduates typically choose.

Degree Requirements

Course	Title	Credits
Major Requirements		
CS 2010	Computing Fundamentals (TECO)	3
CS 2220	Computer Hardware	3
CS 2370	Introduction to Programming	4
CS 2381	Data Structures and Intermediate Programming	4
CS 2470	Systems Programming in C/C++	2
CS 3221	Algorithm Analysis	4
CS 3600	Database Management Systems & Security	4
CS 3720	Systems Analysis and Design	3
CS 3780	Introduction to Computational Theory	3
CS 4140	Software Engineering	3
CS 4250	Computer Architecture	3
CS 4310	Operating Systems	3
CS 4520	CyberEthics (DICO,WRCO)	3
CS 4760	Senior Project	3
MA 2300	Statistics I (QRCO)	3
MA 2450	Mathematical Reasoning	4
Science course with laboratory (not BIDI/CHDI/ESDI/MTDI/PHDI)		4
Major Electives		
Complete two courses from the following:		6-7
CS 2900	Digital and Analog Circuits	
CS 2901	Materials, Design and Fabrication	
CS 2905	PLC Programming	
CS 3015	Mobile Application Development	
CS 3020	Web Programming	
CS 3030		
CS 3240	Data Communication and Computer Networks	
CS 3420	Introduction to Cybersecurity	
CS 3500	Introduction to Artificial Intelligence	
CS 3650	Big Data Administration and Analysis	
CS 3820	Human-Computer Interaction	
CS 4230	System Administration	
CS 4400	Computer Networks and Protocols	
CS 4420	Computer Security	
CS 4920	Computer Science Internship (maximum of three credits)	
Calculus		
MA 2550 & MA 2560	Calculus I (QRCO) and Calculus II (QRCO)	8
General Education (https://coursecatalog.plymouth.edu/general-education/)		
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	3-4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	3-4
SIDI (https://coursecatalog.plymouth.edu/general-education/#SIDI)	Scientific Inquiry Direction	3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
Directions (choose from CTDI, PPDI, SIDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) [1]		4-8
GACO (https://coursecatalog.plymouth.edu/general-education/#GACO)	Global Awareness Connection	3-4
WECO (https://coursecatalog.plymouth.edu/general-education/#WECO)	Wellness Connection	3-4
Electives		15-18
Total Credits		**120**

[1] Directions should total 20 credits (unless the major has a waiver for a specific Direction).

Recommended Course Sequence

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

To complete the bachelor's degree in 4 years, you must successfully complete a minimum of 15 credits each semester or have a plan to make up credits over the course of the 4 years. For example, if you take 14 credits one semester, you need to take 16 credits in another semester. Credits completed must count toward your program requirements (major, option, minor, certificate, general education or free electives).

Course	Title	Credits
Year One		
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
CS 2010	Computing Fundamentals (TECO)	3
CS 2370	Introduction to Programming	4
Complete two-semester Calculus Sequence:		

MA 2550 & MA 2560	Calculus I (QRCO) and Calculus II (QRCO)	8
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	3-4
PPDI (https://coursecatalog.plymou general-education/#PPDI)	Past and Present Direction	3-4
Elective		0-2
	Credits	**29-33**
Year Two		
CS 2220	Computer Hardware	3
CS 2381	Data Structures and Intermediate Programming	4
CS 2470	Systems Programming in C/C++	2
CS 3221	Algorithm Analysis	4
CS 3600	Database Management Systems & Security	4
MA 2450	Mathematical Reasoning	4
MA 2300	Statistics I (QRCO)	3
SIDI (https://coursecatalog.plymou general-education/#SIDI)	Scientific Inquiry Direction	3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
	Credits	**30-32**
Year Three		
CS 3720	Systems Analysis and Design	3
CS 3780	Introduction to Computational Theory	3
Science course with laboratory (not BIDI/CHDI/ESDI/MTDI/PHDI)		4
Directions (choose from CTDI, PPDI, SIDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) [1]		4-8
GACO (https://coursecatalog.plymouth.edu/general-education/#GACO)	Global Awareness Connection	3-4
WECO (https://coursecatalog.plymou general-education/#WECO)	Wellness Connection	3-4
Electives		6-8
	Credits	**26-34**
Year Four		
CS 4140	Software Engineering	3
CS 4250	Computer Architecture	3
CS 4310	Operating Systems	3
CS 4520	CyberEthics (DICO,WRCO)	3
CS 4760	Senior Project	3
Complete two Major Electives from the following:		6-7
CS 3015	Mobile Application Development	
CS 3020	Web Programming	
CS 3240	Data Communication and Computer Networks	
CS 3420	Introduction to Cybersecurity	
CS 3500	Introduction to Artificial Intelligence	
CS 3820	Human-Computer Interaction	
CS 4230	System Administration	
CS 4400	Computer Networks and Protocols	
CS 4420	Computer Security	
CS 4920	Computer Science Internship	
Electives		7-10
	Credits	**28-32**
	Total Credits	**120**

[1] Directions should total 20 credits (unless the major has a waiver for a specific Direction).

Learning Outcomes

- The ability to develop applications to solve small and large problems, both independently and as part of a team.
- An understanding of how the running time of algorithms is measured and the theoretical limitations of computing.
- An understanding of computer instruction-set architecture and experience with hardware-focused programming.
- The ability to communicate technical information to a wide range of audiences.
- An understanding of professional, ethical, and security issues and responsibilities that arise with modern socio-technical systems.

Career Pathways

Computers are used in virtually every industry which requires employees who specialize in computer science. Computer science is not simply a study of how to use computers and various software. Although all computer scientists are proficient in using computers with various operating systems and a variety of software, they have a larger goal: they design and construct or configure computer hardware and software to be used by others. With the need for computers in virtually every industry, the need for employees who specialize in computer science and can incorporate new technologies is ever increasing.

For more information, visit the Career Services site.

Here is a link to A guide for women in STEM created by DDS (Discover Data Science), including STEM scholarship opportunities for women.

Sample Job Titles:

- Computer Programmer
- Computer Systems Manager
- Control Engineer
- Database Administrator
- Manager, Management Information Systems
- Network Administrator
- Quality Assurance Specialist
- Robot Software Engineer
- Robot System Engineer
- Software Designer

- Software Developer
- Software Engineer
- System Analyst
- Web Application Developer
- Technical Writer
- Web Designer

Useful Skills for Jobs in Computing Disciplines:

- Ability to analyze cause and effects
- Ability to think logically and critically
- Strong communication skills
- • Mathematical background