

Computer Science

View Computer Science Department website

The computer science major is designed to prepare students for graduate work in computer science and for a variety of careers in computer science-related fields in government, business or industry.

All students are expected to learn methods and techniques of problem solving, to develop a facility in the expression of problem solutions as computer algorithms and programs and to become acquainted with the major areas of current interest and importance in computer science.

The computer science minor is designed for all interested students, but it is particularly suited for students majoring in mathematics, any of the sciences, economics, psychology, sociology or various special areas such as digital imaging (in the art major), as well as for students interested in pursuing the Master of Arts in Teaching Program after graduation. The minor will introduce the student to programming, algorithms, data structures and computer architecture, as well as some more advanced aspects of computer science.

Learning Outcomes

- Construct solutions to computer science problems using the fundamental principles of computer science (computer science organization, software development, algorithmic design, programming languages, and theoretical foundations)
- Explain at least three specialized areas of computer science, including operating systems, networks, software engineering, architecture, theoretical computer science, and artificial intelligence
- Create complex (multi-class, multi-objective) software applications
- Formulate an informed opinion on a problem in order to inform the design and implementation of a software solution
- Develop a written and oral opinion on a technical subject for a non-expert audience
- Construct solutions to computer science problems using available, reliable sources

Degree Requirements for the Major

General College Requirements

General College Requirements (see Curriculum section), including the following requirements to satisfy the major

Required Courses (32 credit hours)

- COSC 120: Introduction to Computer Science I
- COSC 130: Introduction to Computer Science II
- MATH 151: Calculus I
- MATH 152: Calculus II
- MATH 200: Discrete Mathematics (or MATH 281: Foundations of Mathematics)
- COSC 201: Algorithms and Data Structures
- COSC 230: Computer Architecture
- COSC 251: Programming Languages

Elective Courses (20 credit hours)

Five of the following courses:

- COSC 301: Software Engineering
- COSC 335: Operating Systems
- COSC 336: Computer Networks
- COSC 338: Computer Graphics
- COSC360: Introduction to Data Science
- COSC 370: Artificial Intelligence
- COSC 420: Distributed and Parallel Computing
- COSC435: Acceleration
- COSC 438: Game Design and Development
- COSC 440: Theory of Computation
- COSC 445: Design and Analysis of Algorithms
- COSC 450: Database Management Systems
- COSC 455: Graph Theory
- COSC460: Advanced Data Science and Data Visualization
- COSC 480: Topics in Computer Science

Capstone Experience

Choose One:

- St. Mary's Project (8 credit hours)
- Software Startup Simulator Capstone (COSC401/402, 8 credit hours)

The requirement may also be satisfied by completing a St. Mary's Project in another area. If a student wishes to do a project in another area, the approval of the department must be secured in advance.

Minimum Grade and GPA Requirements

Students must earn a grade of C- or better in all courses required for the major and maintain an overall GPA of 2.0 or better in these required courses.

Recommendations

Certain upper-level computer science positions in government require 15 credit hours of mathematics (including calculus and statistics); we recommend MATH 200, MATH 151, MATH 152, and MATH 221 (Intro to Statistics)."

Degree Requirements for the Minor

Required Courses (12 credit hours)

- COSC 120: Introduction to Computer Science I
- COSC 130: Introduction to Computer Science II
- COSC 201: Algorithms and Data Structures

Elective Courses (12 credit hours)

Three of the following courses:

- MATH 200: Discrete Mathematics (or MATH 281: Foundation of Mathematics)
- COSC230: Computer Architecture
- COSC 251: Programming Languages
- COSC 301: Software Engineering I
- COSC 335: Operating Systems
- COSC 336: Computer Networks
- COSC 338: Computer Graphics
- COSC360: Introduction to Data Science
- COSC 370: Artificial Intelligence

- COSC 420: Distributed and Parallel Computing
- COSC435: Acceleration
- COSC 438: Game Design and Development
- COSC 440: Theory of Computation
- COSC 445: Design and Analysis of Algorithms
- COSC 450: Database Management Systems
- COSC 455: Graph Theory
- COSC460: Advanced Data Science and Visualization
- COSC 480: Topics in Computer Science

Minimum Grade and GPA Requirements

Students must complete the required 24 credit hours, earn a grade of C- or better in each course taken to fulfill the minor, and maintain an overall GPA of 2.0 or better in these required courses.

Faculty

Casey Douglas, Sandy Ganzell, Susan Goldstine, Alan Jamieson (department chair), Lindsay H. Jamieson, Emek Köse, David Kung, Alex Meadows, Simon Read, Ivan Sterling, Ariel Webster.