

Computer Science BS

The BS in Computer Science is designed for those interested in software and computer systems on the technical side. Graduating seniors can find fulfilling careers in many related areas such as cybersecurity, networks, Internet programming, software and mobile apps development, data science, AI, graphics, or pursue additional graduate studies in computer science or in a more specialized area. Some courses are available online, and the entire program can be completed in the evening.

General Education Requirements

All department majors must satisfy the university and appropriate school or college general education requirements (<http://bulletin.umsi.edu/generaleducationrequirements/>). All mathematics courses may be used to meet the university's general education breadth of study requirement in natural sciences and mathematics.

Satisfactory/Unsatisfactory Restrictions

All department majors may not take mathematical and computer sciences courses on a satisfactory/unsatisfactory basis. Students considering graduate study should consult with their advisers about taking work on a satisfactory/unsatisfactory basis.

Degree Requirements

All courses of the department presented to meet the degree requirements must be completed with a grade of C- or better. At least four courses numbered 3000 or above must be taken in residence. Students must have a 2.0 grade point average in the computer science courses completed.

A minimum grade of C- is required to meet the prerequisite requirement for any course except with permission of the department.

Students who are ready to begin their program with CMP SCI 2250 Programming and Data Structures, will be granted credit for CMP SCI 1250, Introduction to Computing, once they complete CMP SCI 2250 with a grade of C- or better.

Note: Courses that are prerequisites for higher-level courses may not be taken for credit or quality points if the higher-level course has been satisfactorily completed.

Declaring the Computer Science Major

Students seeking to major in computer science are first designated as "pre-computer science majors" until they have completed CMP SCI 2750 or equivalent course. Upon successful completion of this course with a grade of C- or better, students will be allowed to declare computer science as their major. This course must be completed successfully within two attempts.

Degree Requirements in Computer Science

Candidates for the B. S. Computer Science degree must complete the following work:

1) Computer Science Core

CMP SCI 1000	Computer Science Experiences	1
CMP SCI 1250	Introduction to Computing	3
CMP SCI 2250	Programming and Data Structures	3

CMP SCI 2261	Object-Oriented Programming	3
CMP SCI 2700	Computer Organization and Architecture	3
CMP SCI 2750	Linux Environment and Programming	3
CMP SCI 3010	Web Programming	3
CMP SCI 3130	Design and Analysis of Algorithms	3
CMP SCI 4250	Programming Languages	3
CMP SCI 4280	Program Translation Project	3
CMP SCI 4500	Introduction to the Software Profession	3
CMP SCI 4760	Operating Systems	3

2) Computer Science Electives

Select five more elective computer science courses, numbered above 3000. 15

3) Mathematics and Statistics

MATH 1320	Introduction to Probability and Statistics	3
MATH 1800	Analytic Geometry and Calculus I	5
MATH 1900	Analytic Geometry and Calculus II	5
MATH 2450	Elementary Linear Algebra	3
MATH 3000	Discrete Structures	3

4) Additional Skills

ENGL 3130	Technical Writing	3
Total Hours		71

There are no related area requirements for majors in Computer Science

Learning Outcomes

Upon completion of the program, graduates will be able to:

- Apply logical reasoning, algorithmic and mathematical principles, and computer science theory to understand and solve a wide variety of computational problems
- Analyze computing problems, their size and scope, and input-output requirements
- Analyze, evaluate, and compare alternative solutions to computing problems, with particular reference to computational complexity, scalability, and usability
- Compare multiple general-purpose programming languages and select and use the appropriate languages for specific applications
- Design, implement (code) and document solutions to computational problems
- Create software systems following specific design and performance requirements within practical constraints
- Implement Internet applications on client and server sides
- Work effectively in teams to design, implement and evaluate solutions to computational problems
- Effectively communicate computer science concepts and solutions, verbally and in writing
- Recognize and promote the professional, social, ethical and legal issues and responsibilities in the computing / software profession

Four Year Plan

First Year

Fall	Hours	Spring	Hours
INTDSC 1003 ¹		1 CMP SCI 1250	3
ENGL 1100		3 MATH 1800	5
MATH 1030		3 CORE – US History & Government	3
MATH 1035		2 EXPLORE – Social Sciences	3
EXPLORE – Humanities & Fine Arts		3 EXPLORE – Humanities & Fine Arts	3
EXPLORE – Social Sciences		3	
	15		17

Second Year

Fall	Hours	Spring	Hours
CMP SCI 2250		3 CMP SCI 2261	3
CMP SCI 2700		3 CMP SCI 2750	3
MATH 1320		3 CMP SCI 3010	3
MATH 1900		5 MATH 3000	3
EXPLORE – Humanities and Fine Arts		3 CORE – Communication Proficiency	3
	17		15

Third Year

Fall	Hours	Spring	Hours
CMP SCI 3130		3 CMP SCI 4760	3
CMP SCI 4250		3 CMP SCI 3000+ level elective	3
CMP SCI XXXX Elective Course		3 CMP SCI 3000+ level elective	3
MATH 2450		3 EXPLORE – Social Sciences	3
ENGL 3130		3 Elective or minor	2
	15		14

Fourth Year

Fall	Hours	Spring	Hours
CMP SCI 4500		3 CMP SCI 4280	3
CMP SCI 3000+ level elective		3 CMP SCI 3000+ level elective	3
Cultural Diversity Requirement		3 Elective or minor	3
Elective or minor		3 Elective or minor	3
Elective or minor		3	
	15		12

Total Hours: 120

¹ INTDSC 1003 is required only for first-time freshmen and transfer students with less than 24 college credits.

Please Note: This plan is an example of what a four year plan could look like for a typical student. Placement exam scores in math as well as the completion of coursework may change the plan. It should not be used in the place of regular academic advising appointments. All students are encouraged to meet with their advisor each semester. All requirements are subject to change.