

# COMPUTER SCIENCE (BS)

Degree: Bachelor of Science

Major: Computer Science

Program Code: 3420

## About This Major . . .

Computer science is the study of algorithms and the issues involved in implementing them. The program includes core courses in algorithms, data structures, logic, programming languages, software design, and advanced mathematics. Electives in web page design, artificial intelligence, robotics, computer graphics, video game design, databases, security, multimedia, and networks are also possible. The program and course offerings are constantly evolving to keep up with the latest changes in the Computer Science field. The small class sizes allow for close interaction between faculty and students, with independent research projects and internships available.

A wide variety of exciting professional and academic opportunities exist for graduates of computer science including software engineering, software testing, computational finance, game design, computer graphics, robotics, artificial intelligence, internet systems and technology, security, hardware development, animation, medicine, biotechnology, business management and consulting, modeling, as well as master's and doctoral studies in computing-related fields. Our graduates have continued on to advanced degrees in top-tier schools and are employed at IBM, Microsoft, Northrup Grumman, Lockheed-Martin, and many other technical companies.

For more information on what you can do with this major, visit Career Services' What to Do with a Major? (<https://www.coloradomesa.edu/career/students/explore/major.html>) resource or the CMU Computer Science (<https://www.coloradomesa.edu/computer-science/>) website.

All CMU baccalaureate graduates are expected to demonstrate proficiency in specialized knowledge/applied learning, quantitative fluency, communication fluency, critical thinking, personal and social responsibility, and information literacy. In addition to these campus-wide student learning outcomes, graduates of this major will be able to:

1. Write programs in multiple programming languages and be able to translate concepts between languages. (Applied Learning)
2. Develop the technical specification, and develop, design and test a software solution for a given problem. (Communication Fluency Quantitative Fluency)
3. Analyze and measure competing hardware and software components and defend a choice for a given situation. (Critical Thinking)
4. Independently learn and use new technologies. (Specialized Knowledge)
5. Work in teams to solve large scale problems. (Applied Learning)

## Requirements

Each section below contains details about the requirements for this program. Select a header to expand the information/requirements for that particular section of the program's requirements.

**To print or save an overview of this program's information, including the program description, learning outcomes, requirements, suggested course sequencing (if applicable), and advising and graduation information, scroll to the bottom of the left-hand navigation menu and select 'Print Options.'** This will give you the options to either 'Send Page to Printer' or

'Download PDF of This Page.' The 'Download PDF of This Page' option prepares a much more concise presentation of all program information. The PDF is also printable and may be preferable due to its brevity.

## Institutional Degree Requirements

The following institutional degree requirements apply to all CMU baccalaureate degrees. Specific programs may have different requirements that must be met in addition to institutional requirements.

- 120 semester hours minimum.
- Students must complete a minimum of 30 of the last 60 hours of credit at CMU, with at least 15 semester hours in major discipline courses numbered 300 or higher.
- 40 upper-division credits (an alternative credit limit applies to the Bachelor of Applied Science degree).
- 2.00 cumulative GPA or higher in all CMU coursework.
- A course may only be used to fulfill one requirement for each degree/certificate.
- No more than six semester hours of independent study courses can be used toward the degree.
- Non-traditional credit, such as advanced placement, credit by examination, credit for prior learning, cooperative education and internships, cannot exceed 30 semester credit hours for a baccalaureate degree. A maximum of 15 of the 30 credits may be for cooperative education, internships, and practica.
- Pre-collegiate courses (usually numbered below 100) cannot be used for graduation.
- Capstone exit assessment/projects (e.g., Major Field Achievement Test) requirements are identified under Program-Specific Degree Requirements.
- The Catalog Year determines which program sheet and degree requirements a student must fulfill in order to graduate. Visit with your advisor or academic department to determine which catalog year and program requirements you should follow.
- See "Requirements for Undergraduate Degrees and Certificates" in the catalog for a complete list of graduation requirements.

## Essential Learning Requirements

(31 semester hours)

See the current catalog for a list of courses that fulfill the requirements below. If a course is an Essential Learning option and a requirement for your major, you must use it to fulfill the major requirement and make a different selection for the Essential Learning requirement.

Code	Title	Semester Credit Hours
<b>English</b> <sup>1</sup>		
ENGL 111	English Composition I-GTCO1	3
ENGL 112	English Composition II-GTCO2	3
<b>Mathematics</b> <sup>1,2</sup>		
MATH 151 or MATH 135	Calculus I-GT-MA1 Engineering Calculus I	3
<b>History</b>		
	Select one History course	3
<b>Humanities</b>		
	Select one Humanities course	3

<b>Social and Behavioral Sciences</b>	
Select one Social and Behavioral Sciences course	3
Select one Social and Behavioral Sciences course	3
<b>Fine Arts</b>	
Select one Fine Arts course	3
<b>Natural Sciences</b> <sup>3</sup>	
Select one Natural Sciences course with a lab	4
Select one Natural Sciences course	3
<b>Total Semester Credit Hours</b>	<b>31</b>

<sup>1</sup> Must receive a grade of "C" or better. Must be completed by the time the student has 60 semester hours.

<sup>2</sup> MATH 151 is 5 credit hours, and MATH 135 is 4 credit hours. Depending on the course selected, 3 credits will apply to the Essential Learning requirements and 1 or 2 credits will apply to Foundation Courses.

<sup>3</sup> One course must include a lab.

## Other Lower Division Requirements

Code	Title	Semester Credit Hours
<b>Wellness Requirement</b>		
KINE 100	Health and Wellness	1
Select one Activity course		1
<b>Essential Learning Capstone</b> <sup>1</sup>		
ESSL 290	Maverick Milestone	3
ESSL 200	Essential Speech	1
<b>Total Semester Credit Hours</b>		<b>6</b>

<sup>1</sup> Essential Learning Capstone must be taken after completion of the Essential Learning English and Mathematics requirements, and when a student has earned between 45 and 75 hours.

## Foundation Courses

(16-18 semester hours)

Code	Title	Semester Credit Hours
CSCI 111	CS1: Foundations of Computer Science	4
CSCI 112	CS2: Data Structures	4
MATH 151	Calculus I-GTMA1	1-2
or MATH 135	Engineering Calculus I	
MATH 152	Calculus II <sup>1</sup>	4-5
or MATH 136	Engineering Calculus II	
STAT 200	Probability and Statistics-GTMA1	3
<b>Total Semester Credit Hours</b>		<b>16-18</b>

<sup>1</sup> MATH 151 is 5 credit hours, and MATH 135 is 4 credit hours. Depending on the course selected, 3 credits will apply to the Essential Learning requirements and 1 or 2 credits will apply to Foundation Courses.

## Program Specific Degree Requirements

(41-42 semester hours, 2.5 GPA is required in major courses, no more than one "D" may be used in completing major requirements.)

Code	Title	Semester Credit Hours
<b>Core Courses</b>		
<i>Computer Science Core</i>		
CSCI 241	Computer Architecture and Assembly Language	4
CSCI 250	CS3: Introduction to Algorithms	3
CSCI 330	Programming Languages	3
CSCI 470	Operating Systems Design	3
CSCI 484	Computer Networks	3
CSCI 490	Software Engineering	3
MATH 369	Discrete Structures I	3
CSCI 310	Advanced Programming: <sup>1</sup>	4
<b>Total Semester Credit Hours</b>		<b>26</b>

<sup>1</sup> CSCI 310 is offered for different languages for 1-3 credit hours. A student may meet the required in any combination number of languages/courses/hours to reach a total minimum of 4 hours taken. No language may be counted for credit more than once.

Code	Title	Semester Credit Hours
<b>Restricted Electives</b>		
<i>Computer Science Choices</i>		
Select five of the following:		15-16
CSCI 306	Web Page Design III	
CSCI 322	Embedded Systems	
CSCI 333	UNIX Operating Systems	
CSCI 337	User Interface Design	
CSCI 345	Video Game Design	
CSCI 370	Computer Security	
CSCI 375	Object Oriented Programming	
CSCI 380	Operations Research	
CSCI 445	Computer Graphics	
CSCI 450	Compiler Structure	
CSCI 460	Database Design	
CSCI 480	Theory of Algorithms	
CSCI 486	Artificial Intelligence	
MATH 361	Numerical Analysis	
<b>Total Semester Credit Hours</b>		<b>15-16</b>

## General Electives

All college level courses appearing on your final transcript, not listed above that will bring your total semester hours to 120 hours. 23-26 semester hours, 5-6 hours of upper division may be needed.

Code	Title	Semester Credit Hours
Select electives		23-26
Total Semester Credit Hours		23-26

## Suggested Course Plan

While the sequencing below culminates in a total of 117-122 semester credit hours, students must complete a minimum of 120 semester credit hours as required for completion of this degree, including satisfactory completion of all required courses. Plan to complete requirements with varying hour options accordingly.

First Year		Semester Credit Hours
<b>Fall Semester</b>		
CSCI 111	CS1: Foundations of Computer Science	4
MATH 151 or MATH 135	Calculus I-GTMA1 or Engineering Calculus I	4-5
ENGL 111	English Composition I-GTCO1	3
KINE 100	Health and Wellness	1
Essential Learning - Social and Behavioral Science		3
Semester Credit Hours		15-16
<b>Spring Semester</b>		
CSCI 112	CS2: Data Structures	4
MATH 152 or MATH 136	Calculus II or Engineering Calculus II	4-5
ENGL 112	English Composition II-GTCO2	3
KINA Activity		1
Essential Learning - Social and Behavioral Science		3
Semester Credit Hours		15-16
<b>Second Year</b>		
<b>Fall Semester</b>		
CSCI 250	CS3: Introduction to Algorithms	3
Essential Learning - History		3
Essential Learning - Humanities		3
Essential Learning - Natural Science with Lab		4
Elective		3
Semester Credit Hours		16
<b>Spring Semester</b>		
CSCI 241	Computer Architecture and Assembly Language	4
STAT 200	Probability and Statistics-GTMA1	3
ESSL 290	Maverick Milestone	3
ESSL 200	Essential Speech	1
CSCI 310	Advanced Programming:	1
Essential Learning - Natural Science		3
Semester Credit Hours		15
<b>Third Year</b>		
<b>Fall Semester</b>		
CSCI 310	Advanced Programming:	3
CSCI 330	Programming Languages	3
Essential Learning - Fine Arts		3
Electives		6
Semester Credit Hours		15
<b>Spring Semester</b>		
Computer Science Choice		3
Computer Science Choice		3
Electives		5-6
MATH 369	Discrete Structures I	3
Semester Credit Hours		14-15

Fourth Year		Semester Credit Hours
<b>Fall Semester</b>		
Computer Science Choice		3
Computer Science Choice		3
CSCI 484	Computer Networks	3
Electives		6-7
Semester Credit Hours		15-16
<b>Spring Semester</b>		
CSCI 470	Operating Systems Design	3
CSCI 490	Software Engineering	3
Computer Science Choice		3
Electives		3-4
Semester Credit Hours		12-13
Total Semester Credit Hours		117-122

## Advising and Graduation

### Advising Process and DegreeWorks

Documentation on the pages related to this program is intended for informational purposes to help determine what courses and associated requirements are needed to earn a degree. The suggested course sequencing outlines how students could finish degree requirements. Some courses are critical to complete in specific semesters, while others may be moved around. Meeting with an academic advisor is essential in planning courses and altering the suggested course sequencing. It is ultimately the student's responsibility to understand and fulfill the requirements for her/his intended degree(s).

DegreeWorks is an online degree audit tool available in MAVzone. It is the official record used by the Registrar's Office to evaluate progress towards a degree and determine eligibility for graduation. Students are responsible for reviewing their DegreeWorks audit on a regular basis and should discuss questions or concerns with their advisor or academic department head. Discrepancies in requirements should be reported to the Registrar's Office.

## Graduation Process

Students must complete the following in the first two months of the semester prior to completing their degree requirements:

- Review their DegreeWorks audit and create a plan that outlines how unmet requirements will be met in the final semester.
- Meet with their advisor and modify their plan as needed. The advisor must approve the final plan.
- Submit the "Intent to Graduate" form to the Registrar's Office to officially declare the intended graduation date and commencement ceremony plans.
- Register for all needed courses and complete all requirements for each degree sought.

Submission deadlines and commencement details can be found at <http://www.coloradomesa.edu/registrar/graduation.html>.

If a student's petition for graduation is denied, it will be her/his responsibility to consult the Registrar's Office regarding next steps.