

# COMPUTER PROGRAMMING CERTIFICATE

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Programming is an essential skill for solving problems in many fields. Programming gives maximum flexibility in processing and understanding data, constructing computational models, and building user friendly applications. Programming skills are in high demand in the marketplace. Completing this certificate could be the first step towards a career that involves software development.

Students will apply object-oriented principles to develop software systems. Students will learn to apply and program data structures like lists, trees, and hash tables. The elective course allows the student to learn about software engineering, web programming, mobile device programming, or user interface design.

## General Certificate Requirements

Additional requirements for graduation can be found on the Degree/Certificate Requirements for Graduation page (<https://catalog.umn.edu/academics/graduation-requirements/>).

Unless otherwise noted in individual program requirements, a minimum grade point average of 2.00 in all work attempted at the University of Montana-Missoula is required for graduation. Please see the Academic Policies and Procedures page (<https://catalog.umn.edu/academics/policies-procedures/>) for information on how your GPA is calculated.

Courses taken to satisfy the requirements of a major, minor, or certificate program must be completed with a grade of C- or better unless a higher grade is noted in the program requirements.

## Post-Secondary Certificate - Computer Programming

### Course Requirements

Code	Title	Hours
<b>Required Courses</b>		
Complete all of the following courses:		
CSCI 150	Introduction to Computer Science <sup>1</sup>	3
CSCI 151	Interdisciplinary Computer Science I	3
<b>Electives</b>		
Complete two of the following courses:		6-7
CSCI 152	Interdisciplinary Computer Science II	
CSCI 181	Web Design and Programming	
CSCI 232	Intermediate Data Structures and Algorithms	
CSCI 258	Web Application Development	
<b>Total Hours</b>		<b>12-13</b>

<sup>1</sup> A placement examination exempts some students from taking CSCI 150. Those students take a CSCI course at the 200 level or higher instead. CSCI 215E and CSCI 315E are writing classes and cannot be applied toward this certificate.