

# COMPUTER SCIENCE COMPREHENSIVE MAJOR: SCIENTIFIC COMPUTING EMPHASIS

A minimum of 62 credits is required, including the 30-credit Computer Science Core:

Code	Title	Credits
<b>Computer Science Core</b>		
CS 190	Computer Science I	3
CS 191	Computer Science II	3
CS 195	Database Management Systems	3
CS 250	Web Applications Development I	3
CS 280	Data Structures	3
CS 330	Operating Systems and Architecture	3
CS 370	Systems Programming in C	3
CS 412	Software Engineering	3
CS 470	Algorithms	3
CS 495	Senior Project	3
<b>Total Credits</b>		<b>30</b>

And the following additional courses:

Code	Title	Credits
CS 303	Machine Learning	3
MATH 151	Calculus I (GT-MA1)	4
MATH 200	Discrete Mathematics	3
MATH 213	Probability and Statistics	3
MATH 251	Calculus II	4
MATH 260	Applied Linear Algebra	3
MATH 314	Applied Probability	3
<b>And three of the following:</b>		<b>9</b>

CS 235	Computers Networks	
CS 310	Programming Projects with X	
CS 320	Programming Languages	
CS 340	Computer Graphics	
CS 360	System Security	
CS 380	The Internet of Things	
CS 390	Software Entrepreneurship	
CS 415	Software Engineering II	
CS 435	Mobile Development	
CS 450	Ethical Hacking and Malware	
CS 460	Network Security	
CS 499	Internship or Field Experience in Computer Science	
ENG 302	Technical Writing	
MATH 252	Calculus III	
MATH 275	Scientific Programming, Modeling, and Simulation	
MATH 300	Introduction to Mathematical Modeling	
MATH 313	Statistical Modeling and Simulation	

MATH 358	Introduction to Differential Equations and Linear Algebra	
MATH 360	Linear Algebra	
MATH 380	Introduction to Cryptography	
<b>Total Credits</b>		<b>32</b>

## Capstone Course Requirement

The following course fulfills the capstone course requirement in the Computer Science Major: CS 495 SENIOR PROJECT.

## Graduation Requirements

Undergraduate programs require a minimum of 120 semester credits for graduation. Of those 120 credits, 40 credits must be in upper-division courses (those marked 300 and above). Fifteen of these 40 upper-division credits must be earned in courses that are part of the standard or comprehensive major program being pursued.

Students are expected to review all graduation requirements, which can be found in the Western Undergraduate Catalog: Graduation Requirements (<https://catalog.western.edu/undergraduate/graduation-requirements/>).

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Course	Title	Credits
<b>Year One</b>		
<b>Fall</b>		
CS 190	Computer Science I	3
ENG 102	Academic Writing (GT-CO1)	3
HWTR 100	First Year Seminar	1
MATH 151	Calculus I (GT-MA1)	4
PHYS 200	General Physics I (with laboratory) (GT-SC1)	4
Elective	H & SS lower-division or Foreign Language course	3
<b>Credits</b>		<b>18</b>
<b>Spring</b>		
CS 191	Computer Science II	3
MATH 251	Calculus II	4
PHIL 200	Symbolic Logic	3
PHYS 201	General Physics II (with laboratory) (GT-SC1)	4
Elective	H & SS lower-division or Foreign Language course	3
<b>Credits</b>		<b>17</b>
<b>Year Two</b>		
<b>Fall</b>		
CS 280	Data Structures	3
CS 330	Operating Systems and Architecture	3
MATH 314	Applied Probability	3
Elective	H & SS lower-division or Foreign Language course	3
Elective	Natural Science	3
Elective	Elective or minor course	3
<b>Credits</b>		<b>18</b>

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<b>Spring</b>		
CS 370	Systems Programming in C	3
CS 412	Software Engineering	3
MATH 200	Discrete Mathematics	3
PHIL 135	Introduction to Ethics	3
Elective	Elective or minor course	3
<b>Credits</b>		<b>15</b>
<b>Year Three</b>		
<b>Fall</b>		
CS 250	Web Applications Development I	3
CS Elective	Upper Division CS elective course	3
MATH 260	Applied Linear Algebra	3
Elective	H & SS elective course	3
Elective	Elective or minor course	3
<b>Credits</b>		<b>15</b>
<b>Spring</b>		
CS 195	Database Management Systems	3
CS Elective	Upper Division CS elective course	3
Elective	Upper Division H & SS elective course	3
Elective	Upper Division elective or minor course	3
MATH 213	Probability and Statistics	3
<b>Credits</b>		<b>15</b>
<b>Year Four</b>		
<b>Fall</b>		
CS 303	Machine Learning	3
CS Elective	Upper Division CS elective course	3
Elective	Upper Division elective or minor course	3
Elective	Upper Division H & SS elective course	3
<b>Credits</b>		<b>12</b>
<b>Spring</b>		
CS 470	Algorithms	3
CS 495	Senior Project	3
CS Elective	CS elective course	3
Elective	Elective or minor course	3
<b>Credits</b>		<b>12</b>
<b>Total Credits</b>		<b>122</b>