B.S. Degree in Computer Science Degree Planner
2022-2023 Catalog

George Mason University
The Volgenau School of Engineering
4300 Nguyen Engineering, 703-993-1530
http://cs.gmu.edu

This bachelor's degree program is accredited by the Computing Accreditation Commission of ABET, http://www.abet.org.

Degree Requirements

For the BSCS degree, students must complete 120 credits, including the Mason Core requirements. The program requires foundation, core, and concentration courses as described below.

Mason Core (24 Credits) - See http://catalog.gmu.edu for course listings

Course Name	Credits:	Term Taken	Grade
Oral Communication: COMM 100/101	Credits: 3		
Written Communication: ENGH 101/100	Credits: 3		
Written Communication: ENGH 302 **(Natural Science)**	Credits: 3		
Literature	Credits: 3		
Arts	Credits: 3		
Western Civilization/World History: HIST 100 or 125	Credits: 3		
Social and Behavioral Science	Credits: 3		
Global Understanding	Credits: 3		

Computer Science Core (35 Credits)			
Course Name	**Credits:**	**Term Taken**	**Grade**
CS 110- Essentials of Computer Science	Credits: 3		
CS 112 - Introduction to Computer Programming or complete CS 108 and CS 109	Credits: 4 or 3+3		
CS 211 - Object-Oriented Programming	Credits: 3		
CS 262 - Introduction to Low-Level Programming	Credits: 3		
CS 306 – Synthesis of Ethics and Law for the Computing Professional	Credits: 3		
CS 310 – Data Structures	Credits: 3		
CS 321 – Software Engineering	Credits: 3		
CS 330 – Formal Methods and Models	Credits: 3		
CS 367 – Computer Systems and Programming	Credits: 4		
CS 471 - Operating Systems	Credits: 3		
CS 483 – Analysis of Algorithms	Credits: 3		

Senior Computing Science (15 Credits)			
Course Name (One of the following): (3 Credits)	Credits:	Term Taken	Grade
CS 455 - Computer Communications and Networking or	Credits: 3		
CS 468 - Secure Programming and Systems or	Credits: 3		
CS 475 - Concurrent and Distributed Systems	Credits: 3		
CS 487 - Introduction to Cryptography	Credits: 3		
And four additional courses chosen from: (12 Credits)			
CS 425 - Game Programming I	Credits: 3		
CS 440 - Language Processors and Programming Environments	Credits: 3		
CS 450 - Database Concepts	Credits: 3		
CS 451 - Computer Graphics	Credits: 3		
CS 452 - Virtual Reality	Credits: 3		
CS 455 - Computer Communications and Networking	Credits: 3		
CS 463 - Comparative Programming Languages	Credits: 3		
CS 465 - Computer Systems Architecture	Credits: 3		
CS 468 - Secure Programming and Systems	Credits: 3		
CS 469 - Security Engineering	Credits: 3		
CS 475 - Concurrent and Distributed Systems	Credits: 3		
CS 477 - Mobile Application Development	Credits: 3		
CS 478 - Natural Language Processing	Credits: 3		
CS 480 - Introduction to Artificial Intelligence	Credits: 3		
CS 482 - Computer Vision	Credits: 3		
CS 484 - Data Mining	Credits: 3		
CS 485 - Autonomous Robotics	Credits: 3		
CS 487 - Introduction to Cryptography	Credits: 3		
CS 490 - Design Exhibition [1]	Credits: 3		
CS 491 - Industry-Sponsored Senior Design Project [1]	Credits: 3 (2x)		
CS 499 - Special Topics in Computer Science [2]	Credits: 3		
MATH 446 - Numerical Analysis I **or** OR 481 – Num Methods in EGR	Credits: 3		

[1] At most 3 credits total of CS 490 and CS 491 may be counted toward the senior computer science requirement.

[2] At most 6 credits total of CS 499 Special Topics in Computer Science may be counted toward the senior computer science requirement.

Computer Science-Related Courses (6 credits) Choose 2	Credits:	Term Taken	Grade
STAT 354 - Probability and Statistics for Engineers and Scientists II	Credits: 3		
OR 335 - Discrete Systems Modeling and Simulation	Credits: 3		
OR 441 - Deterministic Operations Research	Credits: 3		
OR 442 - Stochastic Operations Research	Credits: 3		
ECE 301 - Digital Electronics or ECE 231 and 232	Credits: 3 or 3+1		
ECE 431 - Digital Circuit Design	Credits: 3		
ECE 447 - Single-Chip Microcomputers	Credits: 4		
ECE 450 - Introduction to Robotics	Credits: 3		
ECE 511 - Microprocessors	Credits: 3		
SWE 419 - Object-Oriented Software Design and Implementation	Credits: 3		
SWE 432 – Web Application Development	Credits: 3		
SWE 437 - Software Testing and Maintenance	Credits: 3		

SWE 443 - Software Architectures	Credits: 3		
SYST 371 - Systems Engineering Management	Credits: 3		
SYST 470 - Human Factors Engineering	Credits: 3		
PHIL 371 - Philosophy of Natural Sciences	Credits: 3		
PHIL 376 - Symbolic Logic	Credits: 3		
ENGH 388 - Professional and Technical Writing	Credits: 3		
Any MATH or CS course numbered above 300 (except MATH 351) Note: Those planning to take MATH 352 should replace STAT 344 with MATH 351	Credits: 3		

Mathematics/Statistics (20 credits)

Course Name	Credits:	Term Taken	Grade

MATH 113 - Analytic Geometry and Calculus I
  or complete MATH 123 and MATH 124
	Credits: 4
	  or 3+3		

MATH 114 - Analytic Geometry and Calculus II	Credits: 4		
MATH 125 - Discrete Mathematics I	Credits: 3		
MATH 203 - Linear Algebra	Credits: 3		
MATH 213 - Analytic Geometry and Calculus III	Credits: 3		
STAT 344 - Probability and Statistics for Engineers and Scientists I	Credits: 3		

Natural Science (12 credits)

The BS in Computer Science requires 12 credits of natural science. The courses should be intended for science and engineering students and **must include a two course sequence** with laboratories. Some approved combinations have a total of more than 12 hours. Approved two course sequences with laboratories are:

Biology:			
BIOL 102 - Introductory Biology I	Credits: 4		
BIOL 103 - Introductory Biology II BIOL 105 - Introductory Biology II Lab	Credits: 3 Credits: 1		
Chemistry:			
CHEM 211 - General Chemistry I CHEM 213 –General Chemistry I Laboratory	Credits: 3 Credits: 1		
CHEM 212 - General Chemistry II CHEM 214 - General Chemistry II Laboratory	Credits: 3 Credits: 1		
Geology:			
GEOL 101 - Introductory Geology I	Credits: 4		
GEOL 102 - Introductory Geology II GEOL 104 – Introductory Geology II Laboratory	Credits: 3 Credits: 1		
Physics:			
PHYS 160 - University Physics I PHYS 161 - University Physics I Laboratory	Credits: 3 Credits: 1		
PHYS 260 - University Physics II PHYS 261 - University Physics II Laboratory	Credits: 3 Credits: 1		

Electives (8 credits) Students must complete 8 elective credits.
Total: 120 credits (with 45+ Upper Division)

CS Policies and Procedures

Note: MATH 104, 105, and 108 cannot be counted toward this degree.

CS 110 and 306: Students must take CS 110 within their first year as a CS major. A grade of C or better must be earned in CS 306 for this course to satisfy the Mason Core synthesis requirement.

Grades. Students must earn a C or better in any course intended to satisfy a prerequisite for a computer science course. Computer science majors may not use more than one course with grade of C- or D toward department requirements.

Repeating Courses. Students may attempt an undergraduate course taught by the College of Engineering and Computing (CEC) twice. A third attempt requires approval of the department offering the course. The CS Department may elect not to allow students to retake certain high-demand CS courses in which they have already earned a grade of C or better simply to improve their GPA.

Termination from the Major. No math, science, or CEC course, required for the major, may be attempted more than three times. Those students who do not successfully complete such a course within three attempts will be terminated from the major. Undeclared students in the CEC who do not successfully complete a course required for a CEC major within three attempts will also be terminated. For more information, see the "Termination from the Major" section under AP.5 Undergraduate Policies.

Once a student has attempted one of these courses twice unsuccessfully, the third attempt must be no later than the next semester of enrollment, excluding summers. Failure to take the course at that time will result in termination from the major. If the student is unable to take the course when required, the student may request an extension to a future semester; extensions require approval of the student's advisor, their department, and the Associate Dean for Undergraduate Programs. The deadline for extension requests is the add deadline for the semester in which the course is required.

Students who have been terminated from a CEC major may not register for a CEC course without permission of the department offering the course. This applies to all undergraduate courses offered by the CEC except IT 104 and STAT 250.

A student may not declare any major in the CEC if the student has previously met the termination criteria for that major at any time, regardless of what the student's major was at the time the courses were taken.

Writing-Intensive Requirement. Computer science majors complete the writing-intensive requirement through a sequence of projects and reports in CS 306 and CS 321. Faculty members provide feedback on students' expository writing.

CS Honors Program. The Department of Computer Science offers a CS Honors Program for students with strong computational foundations and the drive to delve deeper into computing. The program is based on the Bachelor of Science in computer science and applied computer science curriculum and is distinct from the University Honors College curriculum. Please talk to a CS Advisor for more information.