

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

**B.S. Degree in Computer Science**  
**2015-2016 Catalog**

**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
Written Communication: ENGH 101 (100) & 302 (Natural Science)	Credits: 6		
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		
COMM 100 - Public Speaking	Credits: 3		

**• Computer Science students must make a technical presentation. COMM 100 fulfills the Mason Core requirement in oral communication for Volgenau School students.**

**Additional Humanities (3 credits)**

Students must complete three additional credits of Humanities courses. This can be fulfilled by any Mason Core course **except** those listed under Information Technology, Synthesis, Quantitative Reasoning, or Natural Science. Students wishing to substitute alternate courses for this requirement must obtain departmental approval.

<b>Additional Humanities Course:</b>	Credits: 3		
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**Computer Science Core (36 Credits)**

Course Name	Credits:	Term Taken	Grade
CS 101 - Preview of Computer Science	Credits: 2		
CS 105 - Computer Ethics and Society	Credits: 1		
CS 112 - Introduction to Computer Programming	Credits: 4		
CS 211 - Object-Oriented Programming	Credits: 3		
CS 262 - Introduction to Low-Level Programming	Credits: 2		
CS 306 – Synthesis of Ethics and Law for the Computing Professional	Credits: 3		
CS 310 – Data Structures	Credits: 3		
CS 321 – Software Requirements and Design Modeling	Credits: 3		
CS 330 – Formal Methods and Models	Credits: 3		
CS 367 – Computer Systems and Programming	Credits: 3		
CS 465 – Computer Systems Architecture	Credits: 3		
CS 483 – Analysis of Algorithms	Credits: 3		
ECE 301 – Digital Electronics	Credits: 3		

<b>Senior Computing Science (15 Credits)</b>			
<b>Course Name (One of the following): (3 Credits)</b>	<b>Credits:</b>	<b>Term Taken</b>	<b>Grade</b>
CS 463 – Comparative Programming Languages or	Credits: 3		
CS 471 – Operating Systems or	Credits: 3		
CS 475 – Concurrent and Distributed Systems	Credits: 3		
<b>And four additional courses chosen from: (12 Credits)</b>			
<b>Course Name</b>	<b>Credits:</b>	<b>Term Taken</b>	<b>Grade</b>
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 455 - Computer Communications and Networking	Credits: 3		
CS 463 - Comparative Programming Languages	Credits: 3		
CS 468 - Secure Programming and Systems	Credits: 3		
CS 469 - Security Engineering	Credits: 3		
CS 471 - Operating Systems	Credits: 3		
CS 475 - Concurrent and Distributed Systems	Credits: 3		
CS 477 - Mobile Application Development	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 490 - Design Exhibition	Credits: 3		
CS 499 - Special Topics in Computer Science (Only three credits of CS 499 can be used toward the senior computer science requirement.)	Credits: 3		
MATH 446 - Numerical Analysis I <b>OR</b> OR 481 - Numerical Methods in Engineering	Credits: 3		

<b>Computer Science-Related Courses (6 credits)</b>			
<b>Course Name (Two courses chosen from):</b>	<b>Credits:</b>	<b>Term Taken</b>	<b>Grade</b>
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 280 - Electric Circuit Analysis	Credits: 5		
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 432 - Design and Implementation of Software for the Web	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 )	Credits: 3		
Note: Those planning to take MATH 352 should replace STAT 344 with MATH 351			

<b>Mathematics/Statistics (20 credits)</b>			
<b>Course Name</b>	<b>Credits:</b>	<b>Term Taken</b>	<b>Grade</b>
MATH 113 - Analytic Geometry and Calculus I	Credits: 4		
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		

<b>Natural Science (12 credits)</b>			
The BS in Computer Science requires 12 credits of natural science. The courses should be intended for science and engineering students and <b>must include a two course sequence</b> with laboratories. Some approved combinations have a total of more than 12 hours. Approved two course sequences with laboratories are:			
· <b>Astronomy:</b>			
ASTR 111 - Introductory Astronomy: The Solar System	Credits: 3		
ASTR 112 - Introductory Astronomy Lab: The Solar System	Credits: 1		
ASTR 113 - Introductory Astronomy: Stars, Galaxies, and the Universe	Credits: 3		
ASTR 114 - Introductory Astronomy Lab: Stars, Galaxies, and the Universe	Credits: 1		
· <b>Biology:</b>			
BIOL 103 - Introductory Biology I	Credits: 4		
BIOL 104 - Introductory Biology II	Credits: 4		
· <b>Chemistry:</b>			
CHEM 211 - General Chemistry	Credits: 4		
CHEM 212 - General Chemistry	Credits: 4		
· <b>Environmental Science:</b>			
EVPP 110 - The Ecosphere: An Introduction to Environmental Science I	Credits: 4		
EVPP 111 - The Ecosphere: An Introduction to Environmental Science II	Credits: 4		
· <b>Geology:</b>			
GEOL 101 - Introductory Geology I	Credits: 4		
GEOL 102 - Introductory Geology II	Credits: 4		
· <b>Physics:</b>			
PHYS 160 - University Physics I	Credits: 3		
PHYS 161 - University Physics I Laboratory	Credits: 1		
PHYS 260 - University Physics II	Credits: 3		
PHYS 261 - University Physics II Laboratory	Credits: 1		

<b>Electives (4 credits)</b> Students must complete 4 elective credits.
<b>Total: 120 credits (with 45+ Upper Division)</b>

\*\*See page 4 for CS Policies and Procedures\*\*

## CS Policies and Procedures

- **Note:** MATH 104, MATH 105, and MATH 108 cannot be counted toward this degree.
- **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 lower toward department requirements.
- **Repeating Courses**

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course. This policy does not apply to STAT 250, which follows the normal university policy for repeating undergraduate courses.
- **Termination from the Major**

No math, science, or Volgenau School of Engineering 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 Volgenau School who do not successfully complete a course required for a Volgenau School major within three attempts will also be terminated. For more information, see the “Termination from the Major” section under AP.5 Undergraduate Policies.

Students who have been terminated from a Volgenau School of Engineering major may not register for a Volgenau School course without permission of the department offering the course. This applies to all undergraduate courses offered by the Volgenau School except IT 103 and STAT 250.
- **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 101, 105, and 306:** Students must take CS 101 within their first year at the university. Students should take CS 105 during their second semester. A grade of C or better must be earned in CS 306 for this course to satisfy the Mason Core synthesis requirement.