# George Mason University
## The Volgenau School of Engineering

## B.S. Degree in Applied Computer Science, Computer Game Design
### 4300 Nguyen Engineering, 703-993-1530
### http://cs.gmu.edu/
### 2016-2017 Catalog

## Degree Requirements

For the BS ACS degree, students must complete 120 credits, including the Mason Core requirements. The program requires foundation, core, and concentration courses as described below. These course requirements provide expertise in programming, computer systems, software requirements and modeling, formal methods, and analysis of algorithms.

### Mason Core (21 Credits)

| Course Name | Credits: | Term Taken | Grade |
|---|---|---|---|
| Written Communication: ENGH 101 (100) & 302 (**Natural Sciences**) | Credits: 6 | | |
| Literature | 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.**

### ACS Foundation Courses (24 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 | | |
| 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 | | |

### ACS core (26 credits)

| Course Name | Credits: | Term Taken | Grade |
|---|---|---|---|
| ECE 301 - Digital Electronics | Credits: 3 | | |
| CS 262 - Introduction to Low-Level Programming | Credits: 2 | | |
| 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: 3 | | |
| CS 465 - Computer Systems Architecture | Credits: 3 | | |
| CS 483 - Analysis of Algorithms | Credits: 3 | | |
| ACS elective (3 credits): One CS course numbered above 400 | Credits: 3 | | |

## ▲ Concentration in Computer Game Design (CGDS)

**Foundation (19 credits)**

| Course Name | Credits: | Term Taken | Grade |
|---|---|---|---|
| CS 225 - Culture and Theory of Games | Credits: 3 | | |
| CS 306 - Synthesis of Ethics and Law for the Computing Professional | Credits: 3 | | |
| CS 325 - Introduction to Game Design | Credits: 3 | | |
| CS 351 - Visual Computing | Credits: 3 | | |
| AVT 104 - Studio Fundamentals I | Credits: 4 | | |
| STAT 344 - Probability and Statistics for Engineers and Scientists I | Credits: 3 | | |

**Core (15 credits)**

| Course Name | Credits: | Term Taken | Grade |
|---|---|---|---|
| CS 425 - Game Programming I | Credits: 3 | | |
| CS 426 - Game Programming II | Credits: 3 | | |
| CS 451 - Computer Graphics | Credits: 3 | | |
| AVT 382 - 2D Experimental Animation | Credits: 3 | | |
| AVT 383 - 3D Experimental Animation | Credits: 3 | | |

**One approved elective related to game design (3 credits)**

Choose one course from the following:

| Course Name | Credits: | Term Taken | Grade |
|---|---|---|---|
| CS 332 - Object-Oriented Software Design and Implementation | Credits: 3 | | |
| CS 455 - Computer Communications and Networking | Credits: 3 | | |
| CS 475 - Concurrent and Distributed Systems | Credits: 3 | | |
| CS 480 - Introduction to Artificial Intelligence | Credits: 3 | | |
| CS 485 - Autonomous Robotics | Credits: 3 | | |
| SWE 432 - Design and Implementation of Software for the Web | Credits: 3 | | |
| GAME 332 - Story Design for Computer Games | Credits: 3 | | |
| AVT 370 - Entrepreneurship in the Arts | Credits: 4 | | |
| AVT 374 - Sound Art I | Credits: 4 | | |
| AVT 487 - Advanced Topics: New Media Art | Credits: 4 | | |

**Natural Science (8 credits)**

| Course Name | | | |
|---|---|---|---|
| PHYS 160 - University Physics I | Credits: 3 | | |
| PHYS 161 - University Physics I Laboratory | Credits: 1 | | |
| One additional lab science | Credits: 4 | | |

**Electives (4 credits)**

**Total: 120 credits (with 45+ Upper Division)**

# CS Policies and Procedures

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

- **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.

- **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.

  The CS Department may not 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 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.

  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 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 104 and STAT 250.

  A student may not declare any major in the Volgenau School of Engineering 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.