

**Volgenau School of Engineering - Applied Computer Science, BS
with Concentration in Software Engineering**

Catalog Year: 2019 - 2020		Grades		
Mason Core Requirements (28 credits)	Course Information	Credits	Earned	Needed
Written Communication:	ENGH 101 (100)	3		
*Oral Communication	*Satisfied by Major Requirements			
*Quantitative Reasoning	*Satisfied by Major Requirements			
*Information Technology	*Satisfied by Major Requirements			
Arts		3		
Global Understanding		3		
Literature		3		
Natural Science with lab		4		
Natural Science Overview		3		
Social & Behavioral Science		3		
Western Civ/World History		3		
**Written Communication	ENGH 302 - **Natural Science Section Only	3		
*Capstone/Synthesis	*Satisfied by Major Requirements			
Major Requirements (89 credits) Students must earn a C or better in any course intended to satisfy a prerequisite for a computer science course. Applied Computer Science majors may not use more than one course with a grade of C- or D toward department requirements				
Computer Science Foundation Requirements (27 credits)		Credits	Earned	Needed
CS 110	Essentials of Computer Science (Mason Core) 1	3		
CS 112	Introduction to Computer Programming (Mason Core)	4		
CS 211	Object-Oriented Programming	3		
MATH 113	Analytic Geometry and Calculus I (Mason Core)	4		
MATH 114	Analytic Geometry and Calculus II	4		
MATH 125	Discrete Mathematics I (Mason Core)	3		
MATH 203	Linear Algebra	3		
Communication	COMM 100 or COMM 101	3		
Core Courses and Major Elective (25 credits)		Credits	Earned	Needed
CS 262	Introduction to Low-Level Programming	3		
CS 310	Data Structures	3		
CS 321	Software Engineering	3		
CS 330	Formal Methods and Models	3		
CS 367	Computer Systems and Programming	4		
CS 471	Operating Systems	3		
CS 483	Analysis of Algorithms	3		
Upper-level CS Elective	One CS course numbered above 400, except CS 498	3		
Concentration in Software Engineering (37 credits)				
Foundation Requirements (6 credits)		Credits	Earned	Needed
STAT 344	Probability and Statistics for Engineers and Scientists I	3		
CS 306	Synthesis of Ethics and Law for the Computing Professional (Mason Co	3		
Core Requirements (31 credits)		Credits	Earned	Needed
SWE 205	Software Usability Analysis and Design	3		
SWE 301	Internship Preparation	0		
SWE 401	Internship Reflection	1		
CS 332	Object-Oriented Software Design and Implementation	3		
SWE 437	Software Testing and Maintenance	3		
SWE Elective (15 credits) from: CS 450, 455, 463, 365, 468, 475, 477, 491; SWE 432, 443		15		
SWE Elective #1:				
SWE Elective #2:				
SWE Elective #3:				
SWE Elective #4:				
SWE Elective #5:				
Cross-Disciplinary Courses: ENGH 388 and one from: PSYC 333, COMM 320, COMM 335		6		
Degree Notes				
Approximately 3 credits of elective courses to bring the degree total to 120 with 45 credits at the 300/400 level				



Volgenau School of Engineering

APPLIED COMPUTER SCIENCE, B.S. Concentration in Software Engineering

2019 - 2020

The Bachelor of Science degree in Applied Computer Science (BS ACS) has been created for those students who want the knowledge and expertise of computer science to work in one of the many disciplines that require advanced computing techniques. These fields do not merely “use” computing but create new and interesting problems for the computer scientist. One such field is the area of Software Engineering.

The objectives of the BS ACS concentration in Software Engineering are to provide students with the following:

1. The fundamental knowledge regarding theory, methods and applications of Computer Science.
2. Foundational knowledge in engineering principles as applied to producing high quality software.
3. An understanding of how to integrate Computer Science and Software Engineering to produce software that is usable, reliable, maintainable, secure, scalable and efficient.
4. Preparation for employment as a software engineer in the software industry.
5. Preparation for graduate studies in fields such as Software Engineering and Computer Science.

Application Area

Software Engineering is one of the largest global industries today. Jobs are plentiful and salaries are high. Whereas in past decades, the success of software was due to efficiency, algorithms and time-to-market; 21st century software must be usable, reliable, maintainable, secure, scalable and efficient. Creating high quality software requires teams of people with highly developed and diverse skills and knowledge of cutting-edge technologies. This program is ideal for students who want careers designing, building and evaluating high quality software products, either as part of a unified team or in leadership roles.

Degree Requirements

The BS ACS in Software Engineering program can be successfully completed within the normal 120 semester hour degree at GMU. In addition to Mason Core requirements including humanities, and social science, the BS ACS Software Engineering concentration requires foundation, core, and elective courses. These course requirements provide students with expertise in programming, computer systems, software requirements and modeling, formal methods and analysis of algorithms. At least 45 semester hours of the degree requirements must be at the 300 level or above.

Sample Schedule

FIRST SEMESTER (14 CREDITS)

CS 110 Essentials of Computer Science	3
CS 112 Introduction to Programming	4
MATH 113 Analytical Geometry & Calculus	4
Mason Core*	3

SECOND SEMESTER (16 CREDITS)

CS 211 Object-Oriented Programming	3
MATH 114 Analytical Geometry & Calculus II	4
SWE 205 Software Usability Design & Analysis	3
Mason Core*	3
Mason Core*	3

THIRD SEMESTER (14 CREDITS)

CS 262 Low-Level Programming	3
CS 310 Data Structures	3
MATH 125 Discrete Mathematics	3
Natural Science w/ Lab	4
Elective	1

FOURTH SEMESTER (16 CREDITS)

CS 330 Formal Methods & Models	3
CS 367 Computer Systems and Programming	4
MATH 203 Linear Algebra	3
Mason Core*	3
Natural Science	3

FIFTH SEMESTER (15 CREDITS)

CS/SWE 332 OO Software Design & Implementation	3
STAT 344 Prob/Stat for Engrs & Scientists	3
SWE Cross Disciplinary Elective	3
ENGH 302 Advanced Composition***	3
Mason Core*	3

SIXTH SEMESTER (15 CREDITS)

CS/SWE 321 Software Engineering	3
SWE 437 Software Testing and Maintenance	3
SWE 301 Internship Preparation	0
SWE Related Elective	3
Mason Core*	3
Mason Core*	3

SEVENTH SEMESTER (15 CREDITS)

SWE Related Elective	3
SWE Related Elective	3
CS 471 Operating Systems	3
ENGH 388 Professional/Technical Writing	3
SWE 401 Internship Reflection	1
Elective	2

EIGHTH SEMESTER (15 CREDITS)

SWE Related Elective	3
SWE Related Elective	3
CS 306 Synth of Ethics & Law for Computing Professional	3
CS 483 Analysis of Algorithms	3
CS Senior Elective	3

We invite requests for additional information. Please contact:
Phone: 703-993-1530; Email: csug@gmu.edu; Website: cs.gmu.edu

* <http://catalog.gmu.edu/mason-core> Mason Core Categories: One course from each: ENGH101, Oral Communication, Arts, Global Understanding, Literature, Western Civilization/World History, Social Behavioral Science, Natural Science, and Natural Science w/ Lab

*** ENGH 101 and Mason Core-Literature must be completed before taking ENGH 302. ACS-SWE students do not need to seek out IT, and Quantitative Reasoning categories as they are built into the major curriculum.