Volgenau School of Engineering - Applied Computer Science, BS
with Concentration in Computer Game Design

Catalog Year: 2019 - 2020			**Grades**	
Mason Core Requirements (18 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	*Satisfied by Concentration Requirement (AVT 104)			
Global Understanding		3		
Literature		3		
*Natural Science	*Satisfied by Major Requirements			
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 (97 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 1	3		
CS 112	Introduction to Computer Programming	4		
CS 211	Object-Oriented Programming	3		
MATH 113	Analytic Geometry and Calculus I	4		
MATH 114	Analytic Geometry and Calculus II	4		
MATH 125	Discrete Mathematics I	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 Computer Game Design (45 credits)				
Concentration Foundation Requirements (19 credits)		Credits	Earned	Needed
GAME 230	History of Computer Game Design	3		
CS 306	Synthesis of Ethics and Law for the Computing Professional	3		
CS 325	Introduction to Game Design	3		
CS 351	Visual Computing	3		
AVT 104	Two-Dimensional Design and Color	4		
STAT 344	Probability and Statistics for Engineers and Scientists I	3		
Concentration Core Requirements (26 credits)		Credits	Earned	Needed
CS 425	Game Programming I	3		
CS 426	Game Programming II	3		
CS 451	Computer Graphics	3		
AVT 382	2D Experimental Animation	3		
AVT 383	3D Experimental Animation	3		
Chose one from: CS 332, 455, 475, 477, 480, 485; SWE 432; GAME 332; AVT 370, 374, 487		3		
PHYS 160/161	University Physics I	4		
One additional lab science		4		
Degree Notes				
Approximately 5 credits of elective courses to bring the degree total to 120 with 45 credits at the 300/400 level				
Advisor Notes:				

Volgenau School of Engineering

APPLIED COMPUTER SCIENCE, B.S.
Concentration in Computer Game Design
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 Computer Game Design.

The objectives of the BS ACS concentration in Computer Game Design are to provide students with the following:

1. The fundamental knowledge regarding theory, methods and applications of Computer Science.
2. A foundation in artistic creativity subjects associated with digital entertainment.
3. Knowledge of concepts that integrate Computer Science and artistic creativity to develop computer games.
4. Preparation for employment as a programmer in the computer games industry.
5. Preparation for graduate studies in fields such as Computer Science and digital entertainment.

Application Area

Computer game development is a global multi-billion dollar industry with popular titles generating millions of dollars in revenue, sometimes in their first few weeks of release. Creating such titles require teams of highly skilled individuals covering such disciplines as computer science, art, animation, music, and storytelling. This program is aimed at those individuals wishing to pursue a career as a programmer in the computer games industry. As part of a highly skilled team, programmers should have an appreciation of all the disciplines in the game development process. Therefore, this program of study provides students with not only a sound background in Computer Science but also an opportunity to undertake courses in the College of Visual and Performing Arts. In addition, a number of Computer Science courses have been specially designed for this program to allow students to become proficient in the computer game development process (by actually creating games during their program of study). Many industries prize skills associated with computer game programming.

Degree Requirements

The BS ACS Game Design concentration 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 Game Design concentration requires foundation, core, and elective courses. Course requirements provide students with expertise in programming, systems, software engineering, 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 (14 CREDITS)	
AVT 104 Studio Fundamentals I (Art MC)	4
CS 211 Object-Oriented Programming	3
MATH 114 Analytical Geometry & Calculus II	4
GAME 230 History of Computer Game Design	3
THIRD SEMESTER (15 CREDITS)	
MATH 125 Discrete Mathematics	3
CS 262 Low-Level Programming	3
CS 310 Data Structures	3
Mason Core*	3
Mason Core*	3
FOURTH SEMESTER (16 CREDITS)	
CS 325 Introduction to Game Design	3
CS 351 Visual Computing	3
CS 367 Computer Systems and Programming	4
MATH 203 Linear Algebra	3
Mason Core*	3
FIFTH SEMESTER (16 CREDITS)	
AVT 382 Digital Art and Animation	3
CS 330 Formal Methods and Models	3
ENGH 302 Advanced Composition***	3
PHYS160+161 University Physics I + Lab	4
Mason Core*	3
SIXTH SEMESTER (15 CREDITS)	
AVT 383 Three Dimensional Digital Art	3
CS 321 Software Engineering	3
CS 451 Computer Graphics	3
Natural Science w/ Lab	4
Elective	2
SEVENTH SEMESTER (15 CREDITS)	
CS 425 Game Programming I	3
CS 483 Analysis of Algorithms	3
STAT 344 Prob/Stat for Engrs & Scientists	3
Mason Core*	3
Game Elective	3
EIGHTH SEMESTER (15 CREDITS)	
CS 306 Synthesis of Ethics & Law	3
CS 471 Operating Systems	3
CS 426 Game Programming II	3
CS Senior Elective	3
Elective	3

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

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