Volgenau School of Engineering

COMPUTER ENGINEERING, B.S.

2017 - 2018

The field of computer engineering plays a major role in everyone's life. Computer engineers are involved in research, development, design, production and operation of a wide variety of products ranging from devices as small as a billionth of a meter, to systems of communication networks spanning large geographical areas and serving millions of people. Computer Engineering is an amalgam of the strongly computer hardware orientation of an electrical engineering program and the operating systems and languages of a computer science program. Reflecting the industry trend to integrate hardware and software development, as well as to blur the lines between hardware and software, the Computer Engineering program is built around software, running on advanced hardware that can simulate and assist in the design of hardware. The curriculum incorporates VHDL (VHSIC Hardware Description Language), one of the two major hardware description languages used throughout the computer engineering industry to model hardware and hardware functionality from the system and architecture level down to the gate level and to include relations to integrated circuit fabrication technology. The program culminates with a senior design project in the final year, where students work in teams to design and build a physical, functional device relying on knowledge and experience gained through the theoretical and laboratory based coursework. Career opportunities exist in the areas of basic research, product design, software engineering, project engineering, engineering management, engineering consultancy, technical sales and many others.

The Computer Engineering program prepares the graduate either for direct entry into a career in engineering or for graduate study. It is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. Recent George Mason computer engineering graduates have gone on to graduate work at highly competitive institutions such as MIT, Stanford, Cornell and California Institute of Technology, and as working engineers at high technology companies and government agencies such as BAE Systems, Boeing, General Electric, General Dynamics, IBM, INTEL, Lockheed-Martin, MITRE, NASA, Naval Research Lab, Northrop Grumman, Orbital Sciences and Raytheon.

Admission Requirements

Admission to George Mason is competitive in that the number of qualified candidates for admission generally exceeds the number of new students who can be accommodated. Each candidate who presents sufficient admission qualifications is reviewed in the context of other qualified applicants. An offer of admission is valid only for the semester for which the student applied. Application for undergraduate admission can be made online at George Mason's website http://admissions.gmu.edu. The Office of Admissions can also provide forms upon request.

Students who have graduated from high school and subsequently attempted course work at a college or university are considered transfer applicants. Those who wish to apply for transfer admission should visit http://admissions.gmu.edu/transfer/ for more information.

Degree Requirements

The computer engineering curriculum requires 126 total credit hours, which can be completed within eight semesters. At least 45 semester hours of the degree requirements must be level 300 or above. Students may wish to consider an extra semester or two for the purpose of lightening the course load (particularly for those with part-time employment); participating in Cooperative Education or work-study (with local industry); achieving a double major (for example with electrical engineering, physics, mathematics, systems engineering or computer science); or adding a minor such as mechanical engineering, business, computer science, mathematics or physics.

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Sample Schedule for Undergraduate Computer Engineering Majors

First Semester	
CS 112 Intro to Computer Programming	4
ECON 103 Contemp. Microeconomic Prin.	3
*Mason Core	3
ENGR 107 Intro to Engineering	2
MATH 113 Calculus I	4
Total Hours	**16**

Second Semester	
CS 211 Object-Oriented Programming	3
MATH 114 Analytic Geom. and Calculus II	4
MATH 125 Discrete Math	3
PHYS 160 University Physics I	3
PHYS 161 University Physics I Lab	1
ECE 101 Intro. to Electrical and Computer Engg	3
Total Hours	**17**

Third Semester	
ECE 201 Intro. to Signal Analysis	3
MATH 203 Linear Algebra	3
MATH 213 Analytic Geom. and Calculus III	3
PHYS 260 University Physics II	3
PHYS 261 University Physics II Lab	1
*Mason Core	3
Total Hours	**16**

Fourth Semester	
ECE 220 Signals and Systems I	3
***ECE 285 Electric Circuit Analysis I	3
ECE 331 Digital System Design	3
ECE 332 Digital Electr. and Logic Design Lab	1
MATH 214 Elem. Differential Equations	3
CS 222 Computer Programming for Engineers	3
Total Hours	**16**

Fifth Semester	
ECE 333 Linear Electronics I	3
ECE 334 Linear Electronics Lab I	1
ECE 445 Computer Organization	3
**ENGH 302 Advanced Composition (Natural Science/ Tech section)	3
ECE 286 Electric Circuit Analysis II	3
CS 310 Data Structures	3
Total Hours	**16**

Sixth Semester	
*Mason Core	3
CS 471 Operating Systems	3
PHYS 262 University Physics III	3
ECE 448 FPGA and ASIC Design w/VHDL	4
STAT 346 Probability for Engineers	3
Total Hours	**16**

Seventh Semester	
Technical Elective	3
*Mason Core	3
ECE 447 Single-Chip Microcomputers	4
ECE 491 Engineering Seminar	1
ECE 492 Senior Advanced Design Project I	1
*Mason Core	3
Total Hours	**15**

Eighth Semester	
Technical Elective	3
Technical Elective	3
*Mason Core	3
ECE 493 Senior Advanced Design Project II	2
ECE 465 Computer Networking Protocols	3
Total Hours	**14**

*Mason Core Categories: One course from each: Oral Communication, ENGH101, Arts, Global Understanding, Literature, Western Civilization/World History. List of approved courses is available on http://catalog.gmu.edu/mason-core

VSE students do not need to seek out Science, Math, and IT categories as they are built into the major curriculum.

**ENGH 101 and Mason Core-Literature must be completed before taking ENGH 302.

***Note that ECE 285/ ECE 286 courses taken at Mason prior to fall 2013 or transferred to Mason prior to fall 2014 do NOT meet the circuit analysis requirement. Students who fit in either category should contact the department as soon as possible to discuss their options.

-The ECE technical electives should be selected from the department's list of approved courses.

-While students are encouraged to follow this schedule to ensure that course pre-requisites are met, please come and see the ECE Dept Academic Advisor for alternate schedules.

We invite requests for additional information. Please contact:

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