

Volgenau School of Engineering - Electrical Engineering, BS with Concentration in Communications and Signal Processing				
Catalog Year: 2019 - 2020		Grades		
Mason Core Reqs (21 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	*Satisfied by Major Requirements			
*Social & Behavioral Science	*Satisfied by ECON 103	3		
Western Civ/World History		3		
**Written Communication	ENGH 302 - **Natural Science Section Only	3		
*Capstone/Synthesis	*Satisfied by Major Requirements			
Major Requirements (100 credits): Students must complete each ECE, ENGR, BENG, CS, MATH, PHYS, and STAT course presented as part of the required 121 credits for the degree with a grade of C or better. Students must also complete any course required by the program that is a prerequisite to another course applicable to the degree with a grade of C or better				
Electrical and Computer Engineering Requirements (44 credits)		Credits	Earned	Needed
ECE 101	Introduction to Electrical and Computer Engineering	3		
ECE 201	Introduction to Signals and Systems	3		
ECE 220	Continuous-Time Signals and Systems	3		
ECE 285	Electric Circuit Analysis I	3		
ECE 286	Electric Circuit Analysis II	3		
ECE 305	Electromagnetic Theory	3		
ECE 331	Digital System Design	3		
ECE 332	Digital Electronics and Logic Design Lab	1		
ECE 333	Linear Electronics I	3		
ECE 334	Linear Electronics Lab I	1		
ECE 350	Embedded Systems and Hardware Interfaces	3		
ECE 433	Linear Electronics II	3		
ECE 445	Computer Organization	4		
ECE 460	Communication and Information Theory	4		
ECE 491	Engineering Seminar	3		
ECE 492	Senior Advanced Design Project I	1		
ECE 493	RS: Senior Advanced Design Project II	1		
Technical Electives (9 credits) from: ECE 370, 410, 415, 422, 424, 430, 431, 446, 447, 450, 462, 463, 465, 470, 499; CYSE 425, 476. Following courses may be taken with prior approval: ECE 508, 510, 511, 513, 521, 526, 527, 528, 530, 531, 535, 538, 542, 548, 550, 565, 567, 584, 586, 587, 590		9		
Choose two Advanced Engineering Labs (2 credits): ECE 429, 434, 447, 448, 461, 467		2		
Additional Support Coursework (44 credits)		Credits		
COMM 100 or 101	Public Speaking or Fundamentals of Communication	3		
CS 112	Introduction to Computer Programming	4		
CS 222	Computer Programming for Engineers	3		
MATH 113	Analytic Geometry and Calculus I	4		
MATH 114	Analytic Geometry and Calculus II	4		
MATH 203	Linear Algebra	3		
MATH 213	Analytic Geometry and Calculus III	3		
MATH 214	Elementary Differential Equations	3		
STAT 346	Probability for Engineers	3		
PHYS 160/161 and 260/261	University Physics I & II	8		
PHYS 262/263	University Physics III	4		
ENGR 107	Introduction to Engineering (Mason Core)	2		
Concentration in Communications and Signal Processing (16 credits)				
ECE 220	Continuous-Time Signals and Systems	3		
ECE 460	Communication and Information Theory	3		
ECE 461 or ECE 467	Communication Engineering or Network Implementation Lab	1		
Three from: ECE 410, 462, 463, 465, 527, 528, 531, 567; CYSE 425, 476; PHYS 306		9		



Volgenau School of Engineering

ELECTRICAL ENGINEERING, B.S. 2019 - 2020

The field of electrical engineering plays a major role in everyone's life. Electrical 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. Electrical engineering efforts show up in such products and processes as personal computers, tablets, cell phones, high-definition television, mobile radios, environmental control systems, digital signal processing, communications and computer networks, and integrated circuit chip design. In health care facilities, electrical engineering technology is found within sophisticated instruments for monitoring patient status, extensive computerized data handling, CAT scan and MRI machines and fiber optic imaging devices for internal examinations. In transportation systems, applications include smart traffic control signals for automobiles, GPS, navigation systems for aircraft and ships and a variety of electronic sensors as well as microprocessors for automotive engine control. 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 Electrical Engineering program prepares graduates either for direct entry into a career in engineering or for graduate study and is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. The curriculum provides a strong background in the fundamentals of electrical engineering and senior level coursework delivers in-depth knowledge in the important areas of Electronics, Communications and Networks, Computer Engineering, and Controls and robotics. 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.

Recent George Mason electrical engineering graduates have gone on to pursue graduate studies 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 Amazon, BAE Systems, Boeing, General Electric, General Dynamics, IBM, INTEL, Lockheed-Martin, MITRE, NASA, Naval Research Lab, Northrop Grumman, Orbital Sciences and Raytheon, among many others.

Degree Requirements

The electrical engineering curriculum requires 121 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 computer engineering, physics, mathematics or computer science); or adding a minor such as mechanical engineering, business, computer science, mathematics or physics.

ELECTRICAL ENGINEERING, B.S.

2019-2020 Sample Schedule for Undergraduate Electrical Engineering Majors

First Semester

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

Second Semester

CS 222 Computer Programming for Engineers	3
ECE 101 Intro to Electrical and Computer Engg	3
MATH 114 Analytic Geom. And Calculus II	4
PHYS 160 University Physics I	3
PHYS 161 University Physics I Lab	1
Total Hours	14

Third Semester

ECE 201 Intro. to Signals and Systems	3
MATH 213 Analytic Geom. and Calculus III	3
PHYS 260 University Physics II	3
PHYS 261 University Physics II Lab	1
ECE 331 Digital System Design	3
ECE 332 Digital Electr. and Logic Design Lab	1
Total Hours	14

Fourth Semester

ECE 285 Electric Circuit Analysis I	3
ECE 220 Cont-Time Signals and Systems	3
MATH 214 Elem. Differential Equations	3
MATH 203 Linear Algebra	3
*Mason Core	3
Total Hours	15

Fifth Semester

ECE 350 Embedded Systems and H/W Interfaces	3
ECE 286 Electric Circuit Analysis II	3
ECE 333 Linear Electronics I	3
ECE 334 Linear Electronics Lab I	1
STAT 346 Probability for Engineers	3
*Mason Core	3
Total Hours	16

Sixth Semester

ECE 421 Classical Systems and Control Theory	3
ECE 433 Linear Electronics II	3
ECE 445 Computer Organization	3
ECE 460 Comm. and Information Theory	3
**ENGH 302 Advanced Composition (Natural Science/ Tech section)	3
Total Hours	15

Seventh Semester

Advanced Engineering Lab	1
Technical Elective	3
*Mason Core	3
*Mason Core	3
ECE 305 Electromagnetic Theory	3
ECE 491 Engineering Seminar	1
ECE 492 Senior Advanced Design Project I	1
Total Hours	15

Eighth Semester

Advanced Engineering Lab	1
Technical Elective	3
Technical Elective	3
ECE 493 Senior Design Project II	2
PHYS 262 University Physics III	3
PHYS 263 University Physics III Lab	1
*Mason Core	3
Total Hours	16

*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.

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

-Undergraduate students may be able to take some 500 level ECE courses as technical electives with permission from the department.

-Students who are accepted into the accelerated Master's program entering their senior year may use up to 6 credits of 500-level courses to meet both BS and MS program requirements, thereby reducing the number of credits required to complete a Master's program upon transition to graduate studies.

-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:

George Mason University
 Volgenau School of Engineering
 Department of Electrical and Computer Engineering
 Nguyen Engineering Building, Suite 3100, Mail Stop 1G5
 Fairfax, VA 22030-4444
 Phone: (703) 993-1569 Fax: (703) 993-1601 ece@gmu.edu
<http://ece.gmu.edu> <http://vse.gmu.edu>