



Volgenau School of Engineering

## ELECTRICAL ENGINEERING, B.S. 2017- 2018

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 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 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.

## 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
<b>Total Hours</b>	<b>16</b>

### 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
<b>Total Hours</b>	<b>14</b>

### Third Semester

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

### Fourth Semester

***ECE 285 Electric Circuit Analysis I	3
ECE 220 Signals and Systems I	3
MATH 214 Elem. Differential Equations	3
ECE 331 Digital System Design	3
ECE 332 Digital Electr. and Logic Design Lab	1
*Mason Core	3
<b>Total Hours</b>	<b>16</b>

### Fifth Semester

ECE 421 Classical Systems and Control Theory	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	
<b>Total Hours</b>	<b>16</b>

### Sixth Semester

Technical Elective	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
<b>Total Hours</b>	<b>15</b>

### 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
<b>Total Hours</b>	<b>15</b>

### 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
<b>Total Hours</b>	<b>13</b>

\*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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