ELECTRICAL AND COMPUTER ENGINEERING MINOR

Banner Code: ECE

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Electrical and computer engineering has transformed every single facet of our lives. The minor in electrical and computer engineering (ECE) is a broad program designed to provide non-ECE students with the foundational knowledge to build and analyze analog and digital circuits as well as signals and systems that form the foundations of any electrical device ranging from smart phones to satellites. These foundation courses enable students to then take on higher-level coursework as part of the minor electives, providing them with a deeper understanding and hands-on opportunity to build a diverse range of hardware systems.

The ECE minor is open to any student (except those pursuing the Electrical Engineering, BS or the Computer Engineering, BS degrees) and is especially conducive to those students with a strong mathematics and science background, such as a major in another engineering or science field as well as those pursuing a bachelor's in computer science. By combining knowledge from their major, students can use the basics and hands-on experiences gained from the ECE minor to design, engineer, build and innovate practical systems to solve real-world problems.

Admissions & Policies

Policies

Eight credits of coursework must be unique to the minor and students must complete all coursework with a minimum GPA of 2.00. For policies governing all minors, see AP.5.3.4 Minors (http://catalog.gmu.edu/policies/academic/undergraduate-policies/#ap-5-3-4).

Requirements

Minor Requirements

Total credits: 18-21

Required Courses

Code	Title	Credits
ECE 101	Introduction to Electrical and Computer Engineering	3
ECE 201	Introduction to Signals and Systems	3
ECE 330	Circuit Theory	3
or ECE 285	Electric Circuit Analysis I	
ECE 301	Digital Electronics	3-4
or ECE 231 & ECE 232	Digital System Design and Digital System Design Lab	
Total Credits		12-13

Technical Electives

Code	Title	Credits
Select at least six credits from the following list:		6-8
ECE 240	C Programming for Engineers	
ECE 286	Electric Circuit Analysis II	
ECE 305	Electromagnetic Theory	
ECE 311	Energy Infrastructure, Market, and Management	
ECE 321	Continuous-Time Signals and Systems	
ECE 333	Linear Electronics I	
ECE 340	Data Structures and Embedded Systems Programming in C/C++	
ECE 350	Embedded Systems and Hardware Interfaces	
ECE 370	Robot Design	
ECE 410	Applications of Discrete-Time Signal Processing	
ECE 411	Electricity Sector Engineering, Economics, and Regulation	
ECE 414	Grid Digitization and Automation	
ECE 415	Power System Analysis	
ECE 416	Electric Machinery and Modern Applications	
ECE 417	Smart Grid and Cyber Security	
ECE 418	Power System Protection and Control	
ECE 419	Power Electronics for Modern Power Systems	
ECE 421	Classical Systems and Control Theory	
ECE 424	Modern Control Systems Design	
ECE 425	Secure RF Communications	
ECE 427	Introduction to Machine Learning and Artificial Intelligence in Engineering	
ECE 430	Principles of Semiconductor Devices	
ECE 431	Digital Circuit Design	
ECE 433	Linear Electronics II	
ECE 445	Computer Organization	
ECE 446	Device Driver Development	
ECE 447	Microcontrollers	
ECE 448	FPGA Design with VHDL	
ECE 450	Mobile Robots	
ECE 455	GPU Architecture and Programming	
ECE 460	Communication and Information Theory	
ECE 462	Data and Computer Communications	
ECE 463	Digital Communications Systems	
ECE 465	Computer Networking Protocols	
ECE 470	Introduction to Humanoid Robotics	
ECE 476	Cryptography Fundamentals	
ECE 480	Small Spacecraft Engineering	
ECE 499	Special Topics in Electrical and Computer Engineering	
Total Credits		6-8