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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 101</td>
<td>Introduction to Electrical and Computer</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Engineering</td>
<td></td>
</tr>
<tr>
<td>ECE 201</td>
<td>Introduction to Signals and Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 330</td>
<td>Circuit Theory</td>
<td>3</td>
</tr>
<tr>
<td>or ECE 285</td>
<td>Electric Circuit Analysis I</td>
<td></td>
</tr>
<tr>
<td>ECE 301</td>
<td>Digital Electronics</td>
<td>3-4</td>
</tr>
<tr>
<td>or ECE 231</td>
<td>Digital System Design</td>
<td></td>
</tr>
<tr>
<td>&amp; ECE 232</td>
<td>and Digital System Design Lab</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits: 12-13

Technical Electives

Select at least six credits from the following list:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C Programming for Engineers</td>
<td>6-8</td>
</tr>
</tbody>
</table>

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 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