As the lines between engineering and scientific disciplines become increasingly blurred, many students are forced to make tough decisions about which major to choose. Traditionally there has been no formal mechanism within the College of Engineering to expose students to substantial academic preparation in more than one department, other than a double-major option, which generally entails a substantial investment of time. A Minor in Electrical Engineering (EE), offered through the EECS Department, is designed to fill this void by providing an avenue for a diverse education for students outside of the EECS department. Due to the extensive breadth of EE discipline areas, students seeking a minor in EE have a spectrum of choices for the program paths they choose. Path options include Applied Electromagnetics, Circuits, Communications, Control Systems, Optics, Power and Energy, Signal Processing, and Solid State.

**Electrical Engineering (EE) Declaration Requirements:**
To declare a minor in EE, you must:

1. Have completed at least one full term at UM Ann Arbor
2. Have an overall UM GPA of 2.0 or better in courses taken at the UM Ann Arbor campus and be in good standing
3. Have completed or earned credit by exam or transfer for at least one course in each of these categories
   a. Calculus (e.g. Math 115, 116, 156)
   b. Calculus based physics lectures (e.g. Physics 140, 160) or chemistry lectures (e.g. Chem 130)
   c. Required engineering courses (Engr 100, 101, 151)

**Minimum Program Requirements**
A minimum of 15 credits must be completed with a grade of a C or better. At least one elective course must be at the 400-level.

**Required course:** EECS 215: Introduction to Circuits
*(Note: BIOMEDE 211 may be used in place of EECS 215 if an additional EECS course is taken from the following approved course lists)*

**One of the following program core courses:**
EECS 216: Signals and Systems  
EECS 230: Electromagnetics I  
EECS 270: Introduction to Logic Design  
EECS 320: Introduction to Semiconductor Devices

**Two of the following courses (at least one course at the 400-level, no duplicates):**
EECS 216: Signals and Systems  
EECS 230: Electromagnetics I  
EECS 270: Introduction to Logic Design  
EECS 270: Introduction to Logic Design  
EECS 320: Introduction to Semiconductor Devices  
EECS 311: Electronic Circuits  
EECS 312: Digital Integrated Circuits  
EECS 330: Electromagnetics II  
EECS 334: Principles of Optics  
EECS 351: Introduction to Digital Signal Processing  
EECS 370: Introduction to Computer Organization  
EECS 373: Design of Microprocessor Based Systems  
EECS 411: Microwave Circuits I  
EECS 413: Monolithic Amplifier Circuits  
EECS 414: Introduction to MEMS  
EECS 418: Power Electronics  
EECS 419: Electric Machinery and Drives  
EECS 420: Phys. Prin. Underlying Smart Devices  
EECS 421: Properties of Transistors  
EECS 423: Solid-State Device Laboratory  
EECS 425: Integrated Microsystems Lab  
EECS 427: VLSI Design I  
EECS 429: Semiconductor Optoelectronic Devices  
EECS 430: Radiowave Propagation & Link Design  
EECS 434: Principles of Photonics  
EECS 452: Digital Signal Processing Lab  
EECS 455: Digital Comm. Signals & Systems  
EECS 460: Control Systems Analysis & Design  
EECS 461: Embedded Control Systems  
EECS 463: Power Systems Design and Operation  
EECS 470: Computer Architecture  
EECS 473: Advanced Embedded Systems  
EECS 530: Electromagnetic Theory I
Sample path options:

<table>
<thead>
<tr>
<th>Path Option</th>
<th>Required Core</th>
<th>Path Prep Core</th>
<th>Elective 1</th>
<th>Elective 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuits and Solid State</td>
<td>215</td>
<td>216</td>
<td>311, 312 or 320</td>
<td>411, 413, 414, 420, 421, 423, 425, 427 or 429</td>
</tr>
<tr>
<td>Electromagnetics and Optics</td>
<td>215</td>
<td>230</td>
<td>330 or 334</td>
<td>411, 430, 434 or 530</td>
</tr>
<tr>
<td>Power and Energy</td>
<td>215</td>
<td>216</td>
<td>320, 418, 419, or 463</td>
<td>418, 419 or 463</td>
</tr>
<tr>
<td>Systems</td>
<td>215</td>
<td>216</td>
<td>351, 455 or 460</td>
<td>351, 452, 455, 460 or 461 (no duplicates)</td>
</tr>
</tbody>
</table>

For more information or to make an advising appointment: http://www.eecs.umich.edu/eecs/undergraduate
3415 EECS Bldg • 734-763-2305 • eceadvising@umich.edu