MASTER OF POWER ENGINEERING

The purpose of this degree program is to prepare students for leading edge positions in industry in the areas of electric power, power electronics, motor drives, and electric machines. The professional Master of Power Engineering is a course-only degree program that prepares students for professional practice in power engineering.

The admission requirements for this degree follow the existing admission requirements for other professional master’s degrees in the ECE department. Students whose accredited B.S. degree is not in electrical engineering may pursue the professional master’s degree, provided that they have an adequate background and can demonstrate proficiency in the material contained in undergraduate courses equivalent to Illinois Institute of Technology’s coursework:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 211 &amp; ECE 213</td>
<td>Circuit Analysis I and Circuit Analysis II</td>
<td>7</td>
</tr>
<tr>
<td>ECE 311</td>
<td>Engineering Electronics</td>
<td>4</td>
</tr>
<tr>
<td>ECE 319</td>
<td>Fundamentals of Power Engineering</td>
<td>4</td>
</tr>
<tr>
<td>MATH 251</td>
<td>Multivariate and Vector Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MATH 252</td>
<td>Introduction to Differential Equations</td>
<td>4</td>
</tr>
</tbody>
</table>

A student may demonstrate proficiency by successfully completing the courses or by demonstrating satisfactory performance in one or more special examinations administered by the ECE department.

**Curriculum**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>Minimum Degree Credits</td>
<td>30</td>
</tr>
<tr>
<td>Maximum 400-Level Credit</td>
<td>12</td>
</tr>
<tr>
<td>Minimum 500-Level Credit</td>
<td>18</td>
</tr>
<tr>
<td>Maximum Short Courses ECE 700-Level Credit</td>
<td>4</td>
</tr>
<tr>
<td>Maximum Transfer Credit</td>
<td>9</td>
</tr>
</tbody>
</table>

**Core Courses** (12-14)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 418</td>
<td>Power Systems Analysis</td>
<td>3-4</td>
</tr>
<tr>
<td>or ECE 419</td>
<td>Power Systems Analysis w/Lab</td>
<td></td>
</tr>
</tbody>
</table>

Select a minimum of three courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 411</td>
<td>Power Electronics</td>
<td>4</td>
</tr>
<tr>
<td>ECE 412</td>
<td>Hybrid Electric Vehicle Drives</td>
<td>3-4</td>
</tr>
<tr>
<td>or ECE 512</td>
<td>Hybrid Electric Vehicle Drives</td>
<td></td>
</tr>
<tr>
<td>ECE 420</td>
<td>Analyt. Methods for Power Syst (For Undergraduate only)</td>
<td>3</td>
</tr>
<tr>
<td>ECE 537</td>
<td>Next Generation Smart Grid</td>
<td>3</td>
</tr>
<tr>
<td>ECE 551</td>
<td>Advanced Power Electronics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Power Systems** (6)

Select a minimum of two courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 417</td>
<td>Power Dist Engring</td>
<td>3</td>
</tr>
<tr>
<td>ECE 553</td>
<td>Power System Planning</td>
<td>3</td>
</tr>
<tr>
<td>ECE 554</td>
<td>Power Systems Relaying</td>
<td>3</td>
</tr>
<tr>
<td>ECE 555</td>
<td>Power Market Operations</td>
<td>3</td>
</tr>
<tr>
<td>ECE 556</td>
<td>Power Mkt Ecnnmc Security</td>
<td>3</td>
</tr>
<tr>
<td>ECE 557</td>
<td>Fault Tolerant Power Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 558</td>
<td>Power System Reliability</td>
<td>3</td>
</tr>
<tr>
<td>ECE 559</td>
<td>High Voltage Power Trans</td>
<td>3</td>
</tr>
<tr>
<td>ECE 560</td>
<td>Power Syst Dynamics Stability</td>
<td>3</td>
</tr>
<tr>
<td>ECE 561</td>
<td>Deregulated Power Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 562</td>
<td>Power Syst Tran Management</td>
<td>3</td>
</tr>
<tr>
<td>ECE 563</td>
<td>Al in Smart Grid</td>
<td>3</td>
</tr>
<tr>
<td>ECE 564</td>
<td>Cntrl Oprtn Elect Power Systs</td>
<td>3</td>
</tr>
</tbody>
</table>
### Master of Power Engineering

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 579</td>
<td>Oper/Plan/Dist Power Grid</td>
<td>3</td>
</tr>
<tr>
<td>ECE 580</td>
<td>Elements of Sustainable Energy</td>
<td>3</td>
</tr>
<tr>
<td>ECE 581</td>
<td>Elements of Smart Grid</td>
<td>3</td>
</tr>
<tr>
<td>ECE 582</td>
<td>Microgrid Design and Operation</td>
<td>3</td>
</tr>
<tr>
<td>CHE 543</td>
<td>Energy Envir Economics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Power Electronics and Motor Drives** *(6)*

Select a minimum of two courses from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 437</td>
<td>Digital Signal Processing I</td>
<td>3-4</td>
</tr>
<tr>
<td>or ECE 436</td>
<td>Digital Signal Pcsig w/Lab</td>
<td></td>
</tr>
<tr>
<td>ECE 531</td>
<td>Linear System Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECE 533</td>
<td>Robust Control</td>
<td>3</td>
</tr>
<tr>
<td>ECE 538</td>
<td>Renewable Energies</td>
<td>3</td>
</tr>
<tr>
<td>ECE 539</td>
<td>Cmpt Aided Dsgn Elec Machines</td>
<td>3</td>
</tr>
<tr>
<td>ECE 442</td>
<td>Internet of Things/Cyber Phys</td>
<td>3</td>
</tr>
<tr>
<td>or ECE 510</td>
<td>IoT and Cyber Physical Systems</td>
<td></td>
</tr>
<tr>
<td>ECE 548</td>
<td>Energy Harvesting</td>
<td>3</td>
</tr>
<tr>
<td>ECE 549</td>
<td>Motion Control Syst Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 550</td>
<td>Power Elect Dynmcs Control</td>
<td>3</td>
</tr>
<tr>
<td>ECE 552</td>
<td>Adjustable Speed Drives</td>
<td>3</td>
</tr>
<tr>
<td>ECE 764</td>
<td>Vehicular Power Systems</td>
<td>2</td>
</tr>
<tr>
<td>CHE 541</td>
<td>Renwble Enrgy Technologies</td>
<td>3</td>
</tr>
</tbody>
</table>

**General Electives** *(4-6)*

Select four to six credit hours

Up to three credit hours of a Graduate Special Project in power engineering (ECE 594 or ECE 597), and up to six credit hours of ECE short courses may be applied to the degree.