Advance your career in the growing field of power electronics and electric machines from a best online graduate program as ranked by U.S. News and World Report.

What You Learn

• Learn the latest technology in power electronics, electric machines, actuators, sensors, drives, motion control and drive applications.
• Learn from distinguished and internationally renowned faculty from the Department of Electrical and Computer Engineering and the Wisconsin Electric Machines and Power Electronics Consortium (WEMPEC).
• Tailor your experience to fit your specific career goals and interests through technical elective courses.

Where & How You Learn

Where Online; start in summer, fall, or spring.
How Start by completing a 9-credit certificate program in Power Conversion and Control (PCC). With successful completion of this Certificate and a minimum GPA of 3.3, you may apply to the online MS degree in Power Engineering. The PCC credits are applied to the 30-credit master’s degree requirement. Labs online during summer months.

At a Glance
Delivery: Online
Credits: 30 graduate credits
Time Frame: 1 year for the PCC Certificate, an additional 2-3 years for the MS degree in Power Engineering, depending on the number of classes taken each term
Tuition: Resident and non-resident: $1,600 per credit

Typical Curriculum
Required Courses, PCC Certificate
• Introduction to Electric Drive Systems
• Power Electronic Circuits
• Automatic Controls
Core ECE MS Curriculum:
Power Engineering
• Electric Machine and Drive System Lab or Power Electronics Lab
• Dynamics and Control of AC Drives
• Solid State Power Conversion
Typical Electives
• Electric Power Systems
• Computer Control of Machines and Processes
• Utility Application of Power Electronics

Questions?
For more information on admission requirements, how to apply, tuition and financial aid or other questions, contact:
Justin Kyle Bush, Graduate Advisor
608-262-0468
gradadmissions@interpro.wisc.edu

Getting exposure to some highly technical topics in the field of power electronics that I would not have had the time or resources to pursue on my own. Now that I have a baseline, I’m able to bring it back to industry and continue building on it.

Nathan Gustafson, Senior Electrical Engineer - Milwaukee Tool
## Required Courses, PCC Certificate

### Introduction to Electric Drive Systems
Learn the basic theory underlying the analysis and design of adjustable-speed drive systems employing power electronic converters and AC or DC machines. Learn the basic concepts of torque and speed control in both DC and AC machines, including variable-frequency operation of induction and synchronous machines, field-oriented control, and more.

### Power Electronic Circuits
In this introduction to the basic power electronic devices, you will study and analyze fundamental power conditioning converters. Course material will cover piecewise linear, uncontrolled circuits; power electronic devices; and AC/DC, DC/DC, AC/AC, and resonant converters.

### Automatic Controls
This course provides a comprehensive understanding of single input, single output (SISO) continuous closed-loop control system analysis and design. Discrete (computer) control also is introduced including analysis in the z domain.

### Core ECE MS Curriculum: Power Engineering

<table>
<thead>
<tr>
<th>Course Level</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core ECE MS</td>
<td>ECE712</td>
<td>Solid State Power Conversion</td>
<td>3</td>
</tr>
<tr>
<td>Core ECE MS</td>
<td>ECE711</td>
<td>Dynamics and Control of AC Drives</td>
<td>3</td>
</tr>
<tr>
<td>Core ECE MS</td>
<td>ECE504</td>
<td>Electric Machine and Drive System Lab</td>
<td>3</td>
</tr>
<tr>
<td>Core ECE MS</td>
<td>ECE512</td>
<td>Power Electronics Lab</td>
<td>3</td>
</tr>
<tr>
<td>Core ECE MS</td>
<td>ECE713</td>
<td>Electromagnetic Design of AC Machines</td>
<td>3</td>
</tr>
<tr>
<td>Core ECE MS</td>
<td>ECE427</td>
<td>Electric Power Systems</td>
<td>3</td>
</tr>
<tr>
<td>Core ECE MS</td>
<td>ECE/</td>
<td>Advanced Robotics</td>
<td>3</td>
</tr>
<tr>
<td>Core ECE MS</td>
<td>ME739</td>
<td>Advanced Robotics</td>
<td>3</td>
</tr>
<tr>
<td>Core ECE MS</td>
<td>ECE714</td>
<td>Utility Application of Power Electronics</td>
<td>3</td>
</tr>
<tr>
<td>Core ECE MS</td>
<td>ME746</td>
<td>Dynamics of Controlled Systems</td>
<td>3</td>
</tr>
<tr>
<td>Core ECE MS</td>
<td>ME747</td>
<td>Advanced Control of Machines and Processes</td>
<td>3</td>
</tr>
</tbody>
</table>

### Technical Electives

<table>
<thead>
<tr>
<th>Course Level</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 3</td>
<td>ECE713</td>
<td>Electromagnetic Design of AC Machines</td>
<td>3</td>
</tr>
<tr>
<td>Spring 3</td>
<td>ECE427</td>
<td>Electric Power Systems</td>
<td>3</td>
</tr>
<tr>
<td>Summer 3</td>
<td>ECE/ME739</td>
<td>Advanced Robotics</td>
<td>3</td>
</tr>
<tr>
<td>Fall 4</td>
<td>ME746</td>
<td>Dynamics of Controlled Systems</td>
<td>3</td>
</tr>
<tr>
<td>Fall 4</td>
<td>ME747</td>
<td>Advanced Control of Machines and Processes</td>
<td>3</td>
</tr>
</tbody>
</table>

1. Listed courses and schedule are subject to change
2. Must apply for admission to MS program with a minimum GPA of 3.3 in the PCC Certificate
3. Offered even-year summers
4. Offered odd-year summers
5. Total of Five 700-level Courses Required
6. Prerequisite for ECE714 is ECE427
7. Prerequisite for ME747 is ME447

---

### Flexible Curriculum

In-depth Technical Knowledge
Start Summer, Fall, or Spring
Learn more at [go.wisc.edu/Power](http://go.wisc.edu/Power)

---

College of Engineering • Interdisciplinary Professional Programs
705 Extension Building 432 North Lake Street Madison, Wisconsin 53706
Phone: 800.462.0876 or 608.262.2061 Fax: 608.263.3160 Web: interpro.wisc.edu