

# ELECTRICAL AND COMPUTER ENGINEERING: POWER ENGINEERING, MS

## REQUIREMENTS

### MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum degree requirements (<https://guide.wisc.edu/graduate/#requirementstext>) and policies (<https://guide.wisc.edu/graduate/#policiestext>), in addition to the program requirements listed below.

### NAMED OPTION REQUIREMENTS MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
No	No	Yes	No	No

#### Mode of Instruction Definitions

**Accelerated:** Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

**Evening/Weekend:** Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

**Face-to-Face:** Courses typically meet during weekdays on the UW–Madison Campus.

**Hybrid:** These programs combine face-to-face and online learning formats. Contact the program for more specific information.

**Online:** These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

### CURRICULAR REQUIREMENTS

#### Requirement Detail

Minimum Credit Requirement

Minimum Residence Credit Requirement

Minimum Graduate Coursework Requirement

15 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: <https://policy.wisc.edu/library/UW-1244> (<https://policy.wisc.edu/library/UW-1244/>).

Overall Graduate GPA Requirement

3.00 GPA required.  
Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: <https://policy.wisc.edu/library/UW-1203> (<https://policy.wisc.edu/library/UW-1203/>).

Other Grade Requirements

In order for courses to count toward your master's degree, students must satisfy the following grade and GPA requirements:

#### E C E Courses

- Grades of B or better are always acceptable.
- BC grades are acceptable if the cumulative GPA for graduate E C E classroom courses is equal to or greater than 3.0.
- Grades of C or lower are not acceptable.

#### Non-E C E Courses

- Grades of B or better are always acceptable.
- BC and C grades are acceptable if approved by the E C E Graduate Committee by way of an appeal.
- Any grade lower than a C is not acceptable.

#### Research and Independent Study Credits

- S grades are acceptable, while U grades are not.
- If it is letter-graded, only grades of B or better are acceptable.

Assessments and Examinations

A thesis, a project, or a specified course sequence must be completed, depending upon which degree plan the student follows.

Language Requirements

n/a

### REQUIRED COURSES

Of the 30 credits required, a minimum of 21 credits must be Electrical and Computer Engineering (E C E ([https://guide.wisc.edu/courses/e\\_c\\_e/](https://guide.wisc.edu/courses/e_c_e/))) courses numbered 400 and above. Of those 21 credits, at least 15 must come from the Power Engineering Course Options below, including at least 3 credits from courses numbered 500–599, and 6 credits from courses numbered 700 or above.

#### Course Path

A maximum of 3 credits in E C E 699 Advanced Independent Study and 3 credits in E C E 999 Advanced Independent Study are allowed. E C E 790 Master's Research or similar research courses may not be used to satisfy the 30-credit requirement.

#### Thesis or Project Path

Students must identify a faculty research advisor and complete a thesis or project paper under their direction. A minimum of 3 credits must be in E C E 790 Master's Research, and no more than 9 credits from any combination of E C E 699 Advanced Independent Study E C E 790 Master's Research or E C E 999 Advanced Independent Study may apply. A minimum of 15 credits of courses numbered 700 or above are required.

**Power Engineering Course Options**

<b>Code</b>	<b>Title</b>	<b>Credits</b>
<b>Core Courses</b>		
Choose at least 15 credits from the following courses, including at least 3 credits from courses numbered 500-599, and 6 credits from courses numbered 700 or above.		
E C E 411	Introduction to Electric Drive Systems <sup>1</sup>	3
E C E 412	Power Electronic Circuits <sup>1</sup>	3
E C E 427	Electric Power Systems	3
E C E/M E 441	Kinematics, Dynamics, and Control of Robotic Manipulators	3
M E 446	Introduction to Feedback Control <sup>1</sup>	3
M E 447	Computer Control of Machines and Processes	3
E C E 504	Electric Machine & Drive System Laboratory	3
E C E 511	Theory and Control of Synchronous Machines	3
E C E 512	Power Electronics Laboratory	3
E C E/COMP SCI/ M E 532	Matrix Methods in Machine Learning	3
E C E 711	Dynamics and Control of AC Drives <sup>1</sup>	3
E C E 712	Solid State Power Conversion <sup>1</sup>	3
E C E 713	Electromagnetic Design of AC Machines	3
E C E 714	Utility Application of Power Electronics	3
M E 746	Dynamics of Controlled Systems	3
or E C E/M E 732	Dynamics of Controlled Systems	
M E 747	Advanced Computer Control of Machines and Processes	3
or E C E/M E 733	Advanced Computer Control of Machines and Processes	
E C E/COMP SCI/ E M A/E P/M E 759	High Performance Computing for Applications in Engineering	3
E C E 901	Special Topics in Electrical and Computer Engineering	1-3

**Research and Independent Study Courses***Course Path*

Students in the course path may complete a maximum of 3 credits each of the following courses:<sup>2</sup>

E C E 699	Advanced Independent Study	3
E C E 999	Advanced Independent Study	3

*Thesis or Project Path*

Students in the thesis or project path must complete a minimum of 3 credits of the following:

E C E 790	Master's Research	3
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No more than 9 credits from any combination of the following: 0-9

E C E 699	Advanced Independent Study	
E C E 790	Master's Research	
E C E 999	Advanced Independent Study	

<sup>1</sup> These courses may be completed via the Capstone Certificate in Power Conversion and Control (<https://guide.wisc.edu/nondegree/capstone/power-conversion-control-capstone-certificate/>).

<sup>2</sup> Students in the course path may not take E C E 790 Master's Research

Students in this program may not take courses outside the prescribed curriculum without faculty advisor and program director approval. Students in this program cannot enroll concurrently in other undergraduate or graduate degree programs.