ELECTRICAL AND COMPUTER ENGINEERING: MACHINE LEARNING AND SIGNAL PROCESSING, M.S.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/#policiesandrequirementstext), in addition to the program requirements listed below.

NAMED OPTION REQUIREMENTS

MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th>Mode to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
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<td>Face</td>
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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 30 credits
- Minimum 23 credits

REQUIRED COURSES

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>E C E 610</td>
<td>Seminar in Electrical and Computer Engineering</td>
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<tr>
<td>E C E 697</td>
<td>Capstone Project in Machine Learning and Signal Processing</td>
<td>1-5</td>
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<tr>
<td>E C E 702</td>
<td>Graduate Cooperative Education Program</td>
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<tr>
<td>E C E/COMP SCI/ME 532</td>
<td>Matrix Methods in Machine Learning</td>
<td>3</td>
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<tr>
<td>E C E/COMP SCI/ME 539</td>
<td>Introduction to Artificial Neural Networks</td>
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<tr>
<td>E C E/COMP SCI 561</td>
<td>Probability and Information Theory in Machine Learning</td>
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<tr>
<td>E C E/COMP SCI 760</td>
<td>Machine Learning</td>
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<tr>
<td>E C E/COMP SCI 761</td>
<td>Mathematical Foundations of Machine Learning</td>
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<tr>
<td>E C E/COMP SCI/STAT 861</td>
<td>Theoretical Foundations of Machine Learning</td>
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<tr>
<td>E C E 431</td>
<td>Digital Signal Processing</td>
<td>3</td>
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<tr>
<td>E C E/COMP SCI 533</td>
<td>Image Processing</td>
<td></td>
</tr>
<tr>
<td>E C E 734</td>
<td>VLSI Array Structures for Digital Signal Processing</td>
<td></td>
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</table>
### Electrical and Computer Engineering: Machine Learning and Signal Processing, M.S.

**ECE 735**  
Signal Synthesis and Recovery Techniques

**ECE 738**  
Advanced Digital Image Processing

**At least 15 credits from the following:**  
15

**ECE 431**  
Digital Signal Processing

**ECE 436**  
Communication Systems I

**ECE 437**  
Communication Systems II

**ECE/COMP SCI/ISYE 524**  
Introduction to Optimization

**ECE/COMP SCI/M E 532**  
Matrix Methods in Machine Learning

**ECE/COMP SCI 533**  
Image Processing

**ECE/COMP SCI/M E 539**  
Introduction to Artificial Neural Networks

**ECE/COMP SCI 561**  
Probability and Information Theory in Machine Learning

**ECE 601**  
Special Topics in Electrical and Computer Engineering (as approved by faculty advisor)

**ECE 717**  
Linear Systems

**ECE 719**  
Optimal Systems

**ECE 729**  
Information Theory

**ECE 730**  
Probability and Random Processes

**ECE 734**  
VLSI Array Structures for Digital Signal Processing

**ECE 735**  
Signal Synthesis and Recovery Techniques

**ECE 736**  
Wireless Communications

**ECE 738**  
Advanced Digital Image Processing

**ECE/COMP SCI 760**  
Machine Learning

**ECE/COMP SCI 761**  
Mathematical Foundations of Machine Learning

**ECE 817**  
Nonlinear Systems

**ECE 830**  
Estimation and Decision Theory

**ECE/COMP SCI/STAT 861**  
Theoretical Foundations of Machine Learning

**ECE 901**  
Special Topics in Electrical and Computer Engineering (as approved by faculty advisor, max of 3 credits)

### Additional courses from the previous list, or up to 7-9 credits of relevant coursework numbered 300 or above in other departments with approval from faculty advisor

Typically in COMP SCI, MATH, STAT, or E P D (Engineering Professional Development)

Up to 3 credits of independent study (such as ECE 699 or equivalent in other department)

### Total Credits 30

1  
All on-campus ECE graduate students must register for 1 credit of ECE 610 during their first semester of graduate studies.

2  
These courses are taken in Summer.

3  
Please keep written communication (emails are acceptable) of approvals from your faculty advisor.

The following courses are not allowed: ECE 611 Introduction to Doctoral Research in Electrical & Computer Engineering or ECE 790 Master's Research, ECE 890 Pre-Dissertator’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, graduate or certificate programs.