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

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

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	30 credits
Minimum Residence Credit Requirement	23 credits

Minimum Graduate Coursework Requirement	15 credits must be graduate-level coursework. Details can be found in the Graduate School's Minimum Graduate Coursework (50%) policy (https://policy.wisc.edu/library/UW-1244 (https://policy.wisc.edu/library/UW-1244/)).
Overall Graduate GPA Requirement	3.00 GPA required. This program follows the Graduate School's GPA Requirement policy (https://policy.wisc.edu/library/UW-1203 (https://policy.wisc.edu/library/UW-1203/)).
Other Grade Requirements	1. A grade of B or better in any graduate course is acceptable. 2. A grade of BC in an E C E course is acceptable, provided the total cumulative GPA for graduate E C E courses is greater than or equal to 3.00. 3. A grade of BC or C in a non-E C E course is acceptable only if approved by the Graduate Committee.
Assessments and Examinations	A specified course sequence must be completed.
Language Requirements	Non-native speakers of English who enroll in the M.S. program must take the ESLAT test on arrival at the university and then take any recommended courses based on the exam results. In addition, if a student's advisor believes that his or her technical writing ability needs improvement, the student may be required to undertake remedial work.

REQUIRED COURSES

Code	Title	Credits
Required Seminar:		**1**
E C E 610	Seminar in Electrical and Computer Engineering [1]	
Hands-on project requirement. Choose one: [2]		**1–5**
E C E 697	Capstone Project in Machine Learning and Signal Processing	
E C E 702	Graduate Cooperative Education Program	
At least one course in Machine Learning:		**3**
E C E/COMP SCI/ M E 532	Matrix Methods in Machine Learning	
E C E/COMP SCI/ M E 539	Introduction to Artificial Neural Networks	
E C E/ COMP SCI 561	Probability and Information Theory in Machine Learning	
E C E/ COMP SCI 760	Machine Learning	
E C E/ COMP SCI 761	Mathematical Foundations of Machine Learning	
E C E/COMP SCI/ STAT 861	Theoretical Foundations of Machine Learning	
At least one course in Signal Processing:		**3**
E C E 431	Digital Signal Processing	
E C E/ COMP SCI 533	Image Processing	
E C E 734	VLSI Array Structures for Digital Signal Processing	

E C E 735	Signal Synthesis and Recovery Techniques	
E C E 738	Advanced Digital Image Processing	
At least 15 credits from the following:		**15**
E C E 431	Digital Signal Processing	
E C E 436	Communication Systems I	
E C E 437	Communication Systems II	
E C E/COMP SCI/ I SY E 524	Introduction to Optimization	
E C E/COMP SCI/ M E 532	Matrix Methods in Machine Learning	
E C E/ COMP SCI 533	Image Processing	
E C E/COMP SCI/ M E 539	Introduction to Artificial Neural Networks	
E C E/ COMP SCI 561	Probability and Information Theory in Machine Learning	
E C E 601	Special Topics in Electrical and Computer Engineering (as approved by faculty advisor)	
E C E 717	Linear Systems	
E C E 719	Optimal Systems	
E C E 729	Information Theory	
E C E 730	Probability and Random Processes	
E C E 734	VLSI Array Structures for Digital Signal Processing	
E C E 735	Signal Synthesis and Recovery Techniques	
E C E 736	Wireless Communications	
E C E 738	Advanced Digital Image Processing	
E C E/ COMP SCI 760	Machine Learning	
E C E/ COMP SCI 761	Mathematical Foundations of Machine Learning	
E C E 817	Nonlinear Systems	
E C E 830	Estimation and Decision Theory	
E C E/COMP SCI/ STAT 861	Theoretical Foundations of Machine Learning	
E C E 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 9 credits of relevant coursework numbered 300 or above in other departments with approval from faculty advisor [3]		**7-9**
Typically in COMP SCI, MATH, STAT, or E P D (Engineering Professional Development)		
Up to 3 credits of independent study (such as E C E 699 or equivalent in other department)		
Total Credits		**30**

[1]

All on-campus E C E graduate students must register for 1 credit of E C E 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: E C E 611 Introduction to Doctoral Research in Electrical & Computer Engineering or E C E 790 Master's Research, E C E 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 or graduate degree programs.