

ROBOTICS ENGINEERING

The ECE Department offers a program totaling 30 credit hours, leading to the degree of Master of Science in Engineering (Robotics Engineering). Students desiring admission to the program must have earned a Bachelor's degree in Robotics, Electrical, Computer, Mechanical, Industrial and Manufacturing Systems Engineering or Computer Science with an overall GPA of 3.0 or higher. Students whose undergraduate background is in other fields may be given conditional admission and would be required to take preparatory courses in the aforementioned fields as described in section V. Students admitted to the program are required to take courses as specified below. Students must earn a B or better in every graduate course to be credited toward the degree requirements. However, a maximum of two grades of B- will be accepted. In addition, students must maintain a cumulative GPA of 3.0 or higher in every semester. Students may be placed on probation, if their cumulative GPA falls below 3.0. Finally, a cumulative GPA of 3.0 or higher is required, in order to be eligible to receive the MSE (RE) degree.

The program may be completed entirely on campus, entirely online, or through a combination of on-campus and online courses.

Program Requirements

Code	Title	Credit Hours
Core Courses		
Required		9
ECE 5001	Analytic and Comp Math	3
ECE 545	Intro Robot Syst	3
Selected ONE course from the following:		
ECE 543	Kinem, Dynam Control Robots	3
ECE 544	Mobile Robots	3
Concentration Courses		9 to 11 credits
Sensing and Processing		
ECE 555	Stochastic Processes	3
ECE 580	Digital Signal Processing	3
ECE 582	Intro to Statistical DSP	3
ECE 584	Speech Processes	3
ECE 586	Digital Image Processing	3
ECE 587	Sel Top:Image Proc/Mach Vision	3
ECE 588	Robot Vision	3
IMSE 606	Advanced Stochastic Processes	3
ECE 642	Robotic Embed Sys	3
Systems and Control		
ECE 560	Modern Control Theory	3
ECE 565	Digital Control Systems	3
ECE 567	Nonlinear Control Systems	3
ECE 643	Humanoids	3
ECE 644	Advanced Robotics	3
ECE 665	Optimal Control Systems	3
ECE 661	Sys Ident and Adaptive Control	3
Machine Learning and Reasoning		

ECE 528	Cloud Computing	3
ECE 537	Data Mining	3
ECE 552	Fuzzy Systems	3
ECE 574	Adv Sftwr Technq in Eng Appl	3
ECE 5752	Reconfigurable Computing	3
ECE 579	Intelligent Systems	3
ECE 5831	Pat Rec & Neural Netwks	3

Autonomous Vehicle

ECE 531	Intelligent Vehicle Systems	3
ECE 532	Auto Sensors and Actuators	3
ECE 533	Active Automotive Safety Sys	3
ECE 535	Mob Dev & Ubiqys Comp Sys	3
ECE 554	Embedded Systems	3
ECE 566	Mechatronics	3
ECE 5701	Intro to Wireless Comm	3
ECE 577	Engineering in Virtual World	3
ECE 679	Adv Intelligent Sys	3

Professional Electives

Select six credit hours	6
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Cognates

Select 4 to 6 credit hours	4-6
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Professional Electives

Students may complete the professional elective in several ways: (1) Elect the thesis ECE 699 (6 credits) to work under the supervision of a faculty advisor, (2) Take directed study by ECE 591 (3 credits) and another RE course at graduate level, (3) take another two RE courses from the list above.

Cognate Courses

Students should select a minimum of 4 and a maximum of 6 credit hours of courses from other disciplines. Some courses from outside ECE may not meet cognate requirement. Please check with the ECE Department prior to registering.

Preparatory Courses

Students with inadequate background in Robotics, Electrical, or Computer Engineering may be required to meet with the department graduate advisor to determine the need for preparatory courses.

For further information please contact:

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Learning Goals

1. A strong background in theories and a good knowledge of the latest technologies in the robotics engineering discipline.
2. An ability to conduct research in advanced engineering fields. The students will possess appropriate skills in formulating problems, designing experiments, collecting, processing, analyzing and interpreting data, designing a system, component, or process to meet desired requirements, and evaluating the system performances.

2 Robotics Engineering

3. An ability to learn the latest research advancement, use advanced techniques and modern engineering tools in engineering practice, evaluate different strategies to derive a feasible solution.