Minor in Robotics

Offered by: Sibley School of Mechanical and Aerospace Engineering, Electrical and Computer Engineering, Computer Science
Administered by: MAE undergraduate coordinator, 125 Upson Hall

Eligibility: All undergraduates except those completing minors in ECE, MechE, or CS.

Educational Objectives: The robotics minor covers the fundamentals of designing, building and programming robots, and in addition requires students to dive deeper in a specific area of robotics.

Requirements:
1) Six distinct courses including at least three from Group A and three from a single category within Group B, must be completed.
2) ME majors may not count MAE 3780 if it is used to satisfy the ME circuits requirement
3) Students may petition to use one semester of independent research (minimum 3 credits of CS 4999 or ECE 4999 or INFO 4900 or MAE 4900) in lieu of one group B course. Such petitions must include a short description of the project and a note from the faculty advisor commenting on the robotics aspect of the project.

Academic Standards: A grade of C or better in each course.

GROUP A: Fundamentals – choose three

CS 4750/5750, ECE 4770, MAE 4760: Foundations of Robotics
MAE 4180/5180, CS 4758/5758, ECE 4180/5772: Autonomous Mobile Robots
MAE 3780/3783: Mechatronics
ECE 3400: Intelligent Physical Systems
CS 4700: Foundations of Artificial Intelligence
INFO 4410/6420 / CS 4754: Human-Robot Interaction
MAE 4810/5810: Robot Perception
ECE 4160/5160, MAE 4190/5190: Fast Robots

GROUP B: Specialization – choose three in one category

Intelligence
CS 4750/5750, ECE 4770, MAE 4760: Foundations of Robotics
CS 4780/5780: Machine Learning for Intelligent Systems
CS 6751 / MAE 6730: Robot Manipulation
MAE 6770: Formal Methods for Robotics
MAE 6790: Intelligent Sensor and Planning Control
ECE 6970: Bio-Inspired Coordination of Multi-Agent Systems
CS 4700: Foundations of Artificial Intelligence
MAE 4180/5180, CS 4758/5758, ECE 4180/5772: Autonomous Mobile Robots
MAE 6710: Human-Robot Interaction
CS 6756: Learning for Robot Decision Making
CS 4789: Introduction to Reinforcement Learning
Modelling, Dynamics, and Control
CS 4750/5750, ECE 4770, MAE 4760: Foundations of Robotics
MAE 4730/5730: Intermediate Dynamics
MAE 4710/5710: Applied Dynamics
MAE 4780/5780: Feedback Control Systems
ECE 4160/5160, MAE4190/5190: Fast Robots
CS 6751 / MAE 6730: Robot Manipulation
MAE 6760: Model based estimation
MAE 6770: Formal Methods for Robotics
MAE 6780: Multivariable Control Theory

Perception
CS 4670 / 5670: Introduction to Computer Vision OR ECE 5470: Computer Vision
CS 6670: Computer Vision
MAE 4810/5810: Robot Perception
MAE 6790: Intelligent Sensor and Planning Control
MAE 4180/5180, CS 4758/5758, ECE 4180/5772: Autonomous Mobile Robots
ECE 4320/MAE 4320: Integrated Micro Sensors and Actuators: Bridging the Physical and Digital Worlds
ECE 4160/5160, MAE4190/5190: Fast Robots
MAE 6760: Model based estimation

Systems and Design
MAE 3780: Mechatronics
ECE 3400: Intelligent Physical Systems
ECE 4320/MAE 4320: Integrated Micro Sensors and Actuators: Bridging the Physical and Digital Worlds
ECE 4760: Designing with Microcontrollers
INFO 4410/6420 / CS 4754; Human-Robot Interaction
INFO 4320: Rapid Prototyping and Physical Computing
DEA 5210: Interaction Design Studio
INFO 4420: HCI Design Studio
ECE 4160/5160, MAE4190/5190: Fast Robots
ECE 5725: Design with Embedded Operating Systems
DEA 6210: Architectural Robotics
MAE 6710: Human-Robot Interaction
ECE 5960: Micro and Nano Robotics
ECE 5960: Micro and Nano Robotics
INFO 5755, INFO 6755, CS 5755: Mobile HRI