

ROBOTICS (ROBO)

ROBO 100 Introduction to Robotics

Description: Introduction to basic robot fabrication and prototyping techniques. Incorporates foundations of sensing, actuation, movement, and control presented through design, build, and operation of robotic systems. Establishes an ethical foundation for robotics engineers.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

ROBO 150 Robotics Tools

Description: Introduction to foundational tools for design, simulation, and code management in robotics including SolidWorks, Matlab, IDE, Github, and potentially ROS or Altium. Principles are applied to problem scenarios in utilization of robotics and automation to address practical challenges. Basic computer programming and embedded systems, engineering economics, topics in CAD, discrete math, and Boolean logic are covered.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

ROBO 302 Robotic Design and Control

Prerequisites: MATH 221

Description: Fundamentals of mechanical and electronic design, control, and fabrication essential for realizing robotic systems. Engage in practical applications of rigid-body motion, machine elements, and interfacing sensors and microcontrollers, with an emphasis on both analysis and hands-on skills.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ROBO 303 Robotic Software and Algorithms

Prerequisites: CSCE 155E (preferred) or CSCE 155N or CSCE 155A or CSCE 155T or CSCE 155H

Description: Algorithms and programming for robotics and artificial intelligence in C++ and high-level scientific programming languages; autonomous navigation and search algorithms; introduction to models of computing through graphs and graph algorithms. Robot Operating System (ROS) and challenges to develop and implement algorithms in ROS. Mapping, localization, data fusion, Simultaneous Localization and Mapping (SLAM), vision processing, communication, and controls.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ROBO 350 Robotic Systems Integration

Description: Focuses on the practical application of robotics by building on core skills with application of analog and digital electronics for robotics including prototyping, testing, debugging; interfacing microcontrollers; and embedded systems that support integrated robotic design. Creation of robotic solutions to address a topic in automation. Provides deeper academic support in the subject of engineering economics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ROBO 395 Internship and Career Experiences

Prerequisites: Permission and advanced approval of plan or work.

Description: Experiential learning in conjunction with an approved industrial or government agency under the joint supervision of an outside sponsor and a faculty advisor. Experiential learning is based on an internship, research activity, entrepreneurial activity, or similar activity.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 3

Grading Option: Graded with Option

Experiential Learning: Internship/Co-op