



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Introduction to Real Time Robotics Systems

ECE 5463

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Components of a robot system, robot forward and reverse kinematics; robot dynamics; robot force generation, robot trajectory generation.

Prerequisites and Co-requisites:

Prereq: Math 2177 or 2174, or 2415 and 2568; and Physics 1250, 1250H, 1260, or 2300; and CSE 1221, 1222, Engr 1181, 1281.01H, 1281.02H, 1221, or 1222; or Grad standing in Engr; or permission of instructor.

Course Goals / Objectives:

- Student are introduced to real-time robotic systems
 - Learn to analyze and design robot manipulators and mobile robots. This includes the study of forward and inverse kinematics, dynamics and trajectory generation for real-time operation.
 - Work to develop a dynamic simulation of a robotic system using high-level languages.
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Course Topics:

- Overview of robotics systems and their programming
 - Homogeneous transformations
 - Forward kinematics
 - Inverse kinematics
 - Dynamics
 - Actuators and their modeling
 - Trajectory generation
 - Generalized forces
 - Simulation of joint actuator systems
 - Mobile robot navigation
 - Mapping and localization
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Designation:

Elective