THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Introduction to Real Time Robotics Systems

MECHENG 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:
- Students are introduced to real-time robotics 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.
- Students are exposed to working in teams to develop a graphical simulation of a robotic system using a high-level language and graphics package.
- Work to develop a graphical dynamic simulation of a robotic system using a high-level language and graphics packaglanguagese

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

Designation:
Elective