

School of Engineering and Computer Science
Mech 468: Robotics

Catalog Data:		Mech 468 Robotics ; 3 credits Industrial robots, kinematics, control, robot programming, interfacing, sensors, actuators, vision systems and mobile robots. Credit not granted for both Mech 468 and Mech 568.
Class Schedule:		Three 50-minute lectures per week, for one semester.
Laboratory Schedule:		Lecture sessions converted into laboratory sessions as needed for demonstrations and hands-on activities.
Prerequisites by Course:		Mech 304, Mech 348
Prerequisites by Topic:		<ol style="list-style-type: none"> 1. Linear algebra, 2. Understanding of dynamics and electrical circuits, 3. Basic understanding of computer programming
Required Texts:		W. Stadler, <i>Analytical Robotics and Mechatronics</i> , McGraw-Hill, 1995.
Course Coordinator:		Dr. Hakan Gurocak
Course Objectives:		<ol style="list-style-type: none"> 1. Understand the main components of a robotic system 2. Understand mathematical models for motion analysis and control of a robot 3. Understand sensors and actuators commonly used in robotic systems 4. Understand basic navigation algorithms used in mobile robots
Topics Covered:		<ol style="list-style-type: none"> 1. Sub-systems and components of a robot 2. Spatial descriptions and transformations 3. Manipulator kinematics 4. Force and torque analysis 5. Trajectory planning and control 6. Sensors, measurement and perception 7. Vision systems in robotics 8. Kinematic modeling of mobile robots 9. Navigation algorithms 10. Robot programming
Lab Experiments and Activities:		Lecture sessions converted into laboratory sessions as needed for demonstrations and hands-on activities.
Course Outcomes:	Students will be able to:	
	Assessed for Program Outcomes	<ol style="list-style-type: none"> E-3. Simulate robot motion. J-1. Describe the impact of robotics in a contemporary issue, such as healthcare, environmental, etc. K-2. Program a robot to provide solutions for practical problems.

	Other	C-2 Design a robotic system following design process. C-3. Design a robotic system that will meet realistic constraints such as economical, manufacturability, safety, etc. C-4. Build a system prototype that meets design specifications.	
Required or Elective Course:	Elective		
Contribution to Professional Component:	Engineering Topics		
Relationship of Course to Program:	Meets: Educational Objectives <u>1, 2, 3, 4</u> Program Outcomes <u>C, E, J, K</u>		
Prepared by:	Dr. Hakan Gurocak	Date:	October 10, 2008
Approved by CAC:			