

ECE 4973/5973
Robotics
Instructor: Sesh Commuri

Fall 2005
TTH: 1:30-245 p.m.
Stephenson Research and Technology Center
Room 1030

Prerequisites: None

Objectives: To understand the kinematics and dynamics of robotic mechanisms. To study the different robotic components, like sensors and actuators, and their effect on the performance. Analyze common industrial robots and their configurations. To impart “hands-on” approach to the design of robotic mechanisms and controllers.

Syllabus

1. Robot Fundamentals	3.0 hours
2. Actuators and Sensors	3.0 hours
3. Manipulator Kinematics	7.5 hours
4. Inverse Kinematics	6.0 hours
5. Velocities and Static Forces	4.5 hours
6. Manipulator Dynamics	9.0 hours
7. Trajectory Generation	3.0 hours
8. Advanced Concepts	6.0 hours
Exams	(3 hours)
Total = 45 hours	

Recommended Text

1. Introduction to Robotics – Mechanics and Control, John J. Craig, Third Edition, Addison Wesley, 2004.

References

1. Introduction to Robotics – Analysis, Systems, Applications, Saeed B. Niku, Pearson Education, 2001.
2. Robot Manipulator Control: Theory and Practice, by Frank L. Lewis, Darren M. Dawson, Chaouki T. Abdallah, Marcel Dekker; 2nd edition, 2003.

Schedule

2 Lectures per week; 1hour 15 minutes per Lecture.

Assessment Methods Used

- 5 Assignments contributing 20% of the final grade.
- 1 Term Project contributing 25% of the final grade.
- 1 Mid-Term Exam contributing to 25% of the final grade.
- 1 Final Exam (Comprehensive) contributing to 30% of the final grade.