NYU Tandon School of Engineering  
Department of Electrical and Computer Engineering  

EL5223: Sensor Based Robotics  

Class Location: JAB775B  
Class Time: Thursday 3 PM – 5:30 PM  

Instructor: Dr. Prashanth Krishnamurthy, LC029, pk@crrl.poly.edu, prashanth.krishnamurthy@nyu.edu  
Office Hours: Tuesday 11:30 PM - 1:30 PM, Thursday 12:00 PM - 1:00 PM; or by appointment  
Course Website: http://crrl.poly.edu/EL5223  

Course Outline  

1: Introduction to robotics and industrial applications.  
2,3: Direct kinematics problem. Denavit-Hartenberg representation, Euler and RPY angles.  
4: Homogeneous Transformations.  
5,6: Inverse kinematics and examples.  
7,8: Manipulator Jacobian, differential relationships, force and moment analysis, inverse Jacobian, trajectory planning.  
9: Midterm.  
12: Basic concepts of mobile robot localization, navigation, and mapping.  
13: Linear controllers for robot manipulators, i.e., PD and PID. Computed torque control for robotic manipulators.  
14: Practical robotic system implementation aspects, limitations and constraints, and sensors and actuators.  
15: Final.  

References:  
2. Lecture notes on the course website.  

Additional References:  

Grading:  
Midterm: 30% , Final: 40% , Homework: 15% , Project: 15%