

Course No.	430.452A	Lecture No.	001	Course Title	Introduction to robotics	Credit	3
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Representative Instructor	Name: Lee Beom-Hee (post : Professor)	Homepage : http://fisl.snu.ac.kr
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	Interview Time/Place : Tue 10:00 ~ 11:00 / ASRI 133-308	

Purpose of Course	Basic theory of Robotics will be overviewed. The lecture will include the coordinate system, kinematics and inverse kinematics, dynamics, and trajectory planning methods for a robot. Also, various sensing and control techniques will be introduced. Especially, the lecture will focus on the linear, nonlinear, and force control methods for robots. Several robot programming methods will be explained with video lectures for intelligent robotics research trend.
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Materials and Reference	J.J. Craig, Introduction to Robotics, Third Edition, Addison-Wesley, 2005.
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Evaluation Method	Attendance	Task	Mid-term	Final	Attitude	Others	Total
	10 %	%	40 %	50 %	%	%	100 %
	Remark of Others						

Prerequisite Course	Some knowledge of basic control theory and linear algebra. Some experience with Mathematics package and c++ is preferred.
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	Week	Topic
Lecture Plan	1	Chapter 1 Overview of robot and robotics
	2	Chapter 2 Coordinate systems with several examples. Homogeneous matrix and coordinate transformations
	3	Chapter 3 Coordinate system assignment for various robots Manipulator kinematics and the related problems
	4	Chapter 4 Inverse kinematics and computational issues
	5	Chapter 5 Jacobians with velocities and static forces
	6	Chapter 6 Manipulator dynamics and computational considerations
	7	Chapter 7 Trajectory generation in joint and Cartesian space. Midterm exam
	8	Chapter 8 Manipulator mechanism design and manipulability measure.
	9	Chapter 9 Linear control of manipulators
	10	Chapter 10 Nonlinear control of manipulators
	11	Chapter 11 Force control of manipulators and intelligent robots
	12	Chapter 12 Robot programming languages and systems: updated video for intelligent robots
	13	Chapter 13 Off-line programming systems
	14	Updated video lecture Video lectures for robot sensing and vision
	15	Final exam