

## ME446.612 Robot Mechanics SMAE@SNU Spring 2012

**Instructor:** Prof. Dongjun Lee (office) 301-1203 (e-mail) [djlee@snu.ac.kr](mailto:djlee@snu.ac.kr) (p) 02-880-7114

**Class Schedule:** Tu/Th 2-3:15pm @ 301-301

**Office Hours:** Tu/Th 4:00-5:00pm or by appointment

**Textbook:**

Murray, Li, Sastry, A Mathematical Introduction to Robotic Manipulation, CRC Press, 1994

**Reference:**

Spong, Hutchinson & Vidyasagar, Robot Modeling & Control, John Wiley & Sons, 2005

**Course Description:** This is a graduate-level introductory course on robotics, with particular emphasis on the analytical treatments of kinematics, dynamics, and nonlinear control of robotic systems. Main topics of the course are:

- Rigid body motion in  $SE(3)$
- Forward and inverse kinematics
- Differential kinematics and Jacobians
- Dynamics: Lagrangian and Newton-Euler approaches
- Nonlinear motion control
- Interaction control
- Nonholonomic systems
- Dynamics and control of constrained systems

**Prerequisites:** Undergraduate-level dynamics, linear algebra, and system dynamics; or by the consent of instructor

**Grading:** homework (20%) mid-term exam (40%) project & presentation (40%)

**Project:** Each student needs to discuss with the instructor during the first half of the course to choose their course project. This project can be freely chosen as long as it has substantial overlaps with the course subjects (e.g. relevant to student's thesis topic or job task).

**Homework:** Homework should be turned in at the beginning of the lecture on the due date. If turned in late on the same day, 50% will be deducted. Otherwise, it will get zero point. Homework will also be graded with the point of 0/0.25/0.5/0.75/1 from 0-1 scale.

**Students conduct:** students are expected to behave professionally in this class: going-in/out during the class, newspaper reading, phone call, texting, or any other unprofessional behaviors (e.g. what you would haven't done in high school) are not allowed.

**Academic integrity:** any academic dishonesty is strictly prohibited in this class, and, if caught, can result in F-grade and academic disciplinary actions.