Introduction to Robotics (CS223A) Handout #01

(Winter 2008/2009)

MW 2:15-3:30 (Gates B01)

Instructor
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Office Hours: MW 4-5pm
Gates Room 144

Teaching Assistants
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Gates B26B (650) 736-1817 (SCPD students only)

The purpose of this course is to introduce you to basics of modeling, design, planning, and control of robot systems. In essence, the material treated in this course is a brief survey of relevant results from geometry, kinematics, statics, dynamics, and control.
The course is presented in a standard format of lectures, readings and problem sets. There will be an in-class midterm and final examination. These examinations will be open book. Lectures will be based mainly, but not exclusively, on material in the Lecture Notes book. Lectures will follow roughly the same sequence as the material presented in the book, so it can be read in anticipation of the lectures.

A problem set will be distributed once a week and will be due 7 days later. All homework will be graded. Anything handed in after 5 p.m. on the due date will be penalized by 30% for each 24 hours of lateness. In order to receive a grade at the end of the course, all homework must have been handed in.

If you are interested in having a homework assignment or an exam re-graded, please submit a written explanation of your reasons to seek a re-grade along with the graded paper to a teaching assistant.

The final grade will be a weighted average of:

- Homeworks - 30%
- Midterm - 25%
- Final - 45%

All homework is to be done individually. If you have any difficulties, you are urged to bring your questions to the professor or the TA.

Check out the class homepage: *http://www.stanford.edu/class/cs223a*. Since this page will be the most up to date source of information for the class, please check it regularly for handouts and other announcements.

CS223A Lecture and Reading Schedule

1/7 W Introduction (*read handout*)
1/12 M Spatial descriptions 1 (*read LN:ch1*)
1/14 W Spatial descriptions 2 (*read LN:ch1*)
1/19 M Holiday (*Martin Luther King*)
1/21 W Forward Kinematics 1 (*read LN:ch2*)
1/26 M Forward Kinematics 2 (*read LN:ch2*)
1/28 W Jacobians: Velocities (*read LN:ch4*)
2/02 M Jacobians: Explicit Form (*read LN:ch4*)
2/04 W Jacobians: Static Forces (*read LN:ch4*)
2/09 M Vision in Robotics (Guest Lecturer)
2/09 M Review - Group I (7-9pm, Gates 119)
2/10 T Review - Group II (7-9pm, Gates 119)
2/11 W Midterm examination (*in class*)
2/16 M Holiday (*President's day*)
2/18 W Inverse Kinematics/Trajectory generation (*read LN:ch3,ch6*)
2/23 M Dynamics: Acceleration and Inertia (*read LN:ch5*)
2/25 W Dynamics: Explicit Form (*read LN:ch5*)
3/02 M Control: PID control (*read LN:ch7*)
3/04 W Control: Joint space control (*read LN:ch7*)
3/09 M Control: Operational space control and Force control (*read LN:ch7*)
3/10 T Review - group I (7-9pm, Gates 119)
3/11 W Advanced Topics
3/11 W Review - group II (7-9pm, Gates 119)
3/16 M Final examination (*12:15 pm - 3:15 pm*)

Lecture Notes and Reference Book

Lecture Notes, available for purchase in the Stanford Bookstore:
Introduction to Robotics, Khatib, O. and Kolarov, K.

Reference Book, on reserve in the Engineering Library:
Introduction to Robotics: Mechanics and Control, John J. Craig, Pearson Education, 3rd Edition, 2005

Reference Book:
Robot Modeling and Control, M. Spong, M. Vidyasagar, S. Hutchinson, Wiley & Sons, 2006