COURSE CALENDAR DESCRIPTION

An introduction to robotic manipulators and autonomous vehicles. The course covers the kinematics and dynamics of manipulators and autonomous platforms, robot sensors and navigation. Twelve supervised laboratory hours. Prerequisites: General prerequisite; LE/EECS 2030 3.00 or LE/EECS 1030 3.00; SC/MATH 1025 3.00, SC/MATH 1310 3.00, LE/EECS 2031 3.00. Course credit exclusions: LE/CSE 4421 3.00, AK/AS/SC/CSE 4421 3.00. (NOTE: The General Prerequisite is a cumulative GPA of 4.50 or better over all major EECS courses. EECS courses with the second digit “5” are not major courses.)

INSTRUCTOR(S)

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<th>Section / Format / Term</th>
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TOPICS AND CONCEPTS

SOME COURSE TOPICS INCLUDE

- Robot Locomotion and Sensing
- Mathematics of Motion Representation
- Robotic Manipulator Forward and Inverse Kinematics
- Dealing with uncertainty, Kalman filter
- Robot Vision
- Path Planning and Pose Maintenance
- Manipulator Velocities and Forces
- Control concepts (optionally)

LIST OF LEARNING OUTCOMES AND EXAMPLES OF

Learning outcomes for this course include:

- Explain the basic terms and key concepts behind mobile robots and robot arms.
- Analyse the forward and inverse kinematics of mobile robots and robot arms.
- Apply basic mathematical techniques to solve problems in robotics.
- Analyse the effects of noise in robotic navigation.
- Use techniques to reduce the effects of noise in robotic navigation.
- Develop software to solve problems in robotics.

GRADED ASSESSMENT

Evaluation

The final grade of the course is usually based on a combination of lab exercises, a midterm, and a final exam.
ADDITIONAL INFORMATION

TEXTBOOK
Recommended for the second half of the course (not required):
"Probabilistic Robotics"
Sebastian Thrun, Wolfram Burgard, and Dieter Fox
The MIT Press, 2006

ACADEMIC INTEGRITY LINKS
- Senate Policy on Academic Honesty - http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/
- Academic Integrity - http://lassonde.yorku.ca/academic-integrity

STUDENT LINKS
- Student Rights and Responsibilities - http://oscr.students.uit.yorku.ca/student-conduct
- Religious Observance - https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs
- Counselling and Disability Services - http://cds.info.yorku.ca/

Many courses utilize Moodle, York University’s course website system. If your course is using Moodle, click here to access it.
Moodle @ York University