

ENGR421/521: Applied Robotics (4 credits) Spring 2014 Syllabus

CATALOG DESCRIPTION

Robots are devices that can sense their environment, reason about the acquired information, and act on their environment. This course is a multidisciplinary hardware project design experience in which small teams of electrical and computer engineering, mechanical engineering, and computer science students deliver an end-of-course demonstration of a final robotic system. Throughout the semester, the students configure, design, implement, test and evaluate in the laboratory a succession of mechatronic devices and subsystems culminating in the final integrated system. Lectures during the first half of the quarter will complement the laboratory experience with comparative surveys, operational principles, integrated design issues, and brainstorming associated with the spectrum of mechanism, electronics, and control components. Lecture coverage includes information needed to complete the main project: mechanisms, motors, motor drives, sensors, interface circuits, microcontroller programming, and control.

PREREQUISITES

Graduate or Pro-school status in College of Engineering, or with approval of instructor

INSTRUCTORS

Prof. Jonathan Hurst, Dearborn 218A
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TEACHING ASSISTANTS

Matt Rueben, ruebenm@onid.orst.edu
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CLASS MEETINGS

Lecture:	Covell 221	Tuesday and Thursday	4:00-5:20 PM
Lab:	Covell 021	Tuesday	12:00 – 1:50 PM

ELECTRONIC FILE ACCESS

<http://piazza.com>

COURSE LEARNING OUTCOMES

- 1) Create a robotic system which can sense its environment, reason about it, and act on it
- 2) Design and build the mechanical subsystem with appropriate actuators and sensors for computer control
- 3) Implement basic electronic circuits and data acquisition techniques to interface a computer to the mechanical subsystem
- 4) Design, write and debug computer programs that control the mechanical system
- 5) Graduate Students have three choices: 1) dynamic model of robot, comparison to final device 2) simulation of AI for robot 3) power analysis of electrical system, comparison to final device.

GRADING

Weekly Demonstrations: 20%
Design Proposal: 10%
Mid-Quarter Design Presentation: 10%
Final Comprehensive Web Page: 30% (graduate students: 15%)
Graduate Student project: 15%
Final Demonstration: 30%
Final grade subject to instructor adjustment based on individual performance within the teams.

LAB POLICIES

- Follow the Reasonable Person Principle
- Clean up after yourselves

STATEMENT REGARDING STUDENTS WITH DISABILITIES

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

Link to Student Conduct Code: <http://oregonstate.edu/studentconduct/>

You will be expected to conduct yourself in a professional manner. Academic dishonesty such as plagiarism and cheating will not be tolerated. Therefore, students are expected to be honest and ethical in their academic work. If you are found engaging in an act of academic dishonesty, you will be reported to the office of student conduct and the suggested penalty will be an F in the course.

Academic dishonesty is defined as an intentional act of deception in one of the following areas:

- * Cheating - use or attempted use of unauthorized materials, information or study aids,
- * Fabrication - falsification or invention of any information,
- * Assisting - helping another commit an act of academic dishonesty,
- * Tampering - altering or interfering with evaluation instruments and documents, or
- * Plagiarism - representing the words or ideas of another person as one's own.

For more information about academic integrity and the University's policies and procedures in this area, please refer to the Student Conduct web site.

LINK TO STATEMENT OF EXPECTATIONS FOR STUDENT CONDUCT: <http://oregonstate.edu/studentconduct/code/index.php>