

## ROBOTICS

- COURSE:** CENG 6533 SPRING 2015  
MW 5:30-6:50 PM
- INSTRUCTOR:** Dr. Thomas L. Harman harman@uhcl.edu
- OFFICE:** D104 Phone: 283-3774
- OFFICE HOURS:** M 1PM-4PM and Evenings (Check office or lab D125)
- PREREQUISITES:** Graduate Standing
- DESCRIPTION:** The course presents a study of techniques applied to the study of robotics. The purpose is to introduce the students to the use of robots and the techniques necessary to design and develop hardware and software for applications.
- COURSE FORMAT:** The course format will consist of lectures with homework and examinations. In addition to regular homework and examinations, a project report will be due at the end of the semester.
- TEXT:** Robotic Engineering, Richard D. Klafter, et. al., Prentice-hall. This should be available used. Try the WEB sources for a good deal.
- GRADING:** The grade will be divided as follows:
- |                           |     |
|---------------------------|-----|
| Exams and Quizzes         | 55% |
| Homework                  | 30% |
| Project and presentation* | 15% |
- The project will consist of a design with documentation for a complete robotic system serving some useful purpose. The presentation will consist of a brief lecture and report on the project at the end of the semester.
- NOTE:** The project can be used as preparation for the Capstone course or a thesis.  
**\*In this case, the project will count more toward your final grade.**

# **ROBOTICS**

CENG 6533 Course Outline  
(Tentative – Changes with interest of the students)

## Material to be covered

**Introduction** History and Survey of Robotics

Classification of Robots

Example Systems – various actual systems will be studied

**Systems View of Robots**

Sensing, data acquisition, and control

More on Specification of Robot Systems

**DUE: BRIEF ORAL AND WRITTEN SUMMARY OF PROJECT.**

**Mechanical Components of a Robot**

**Control of Actuators**

## **MIDTERM EXAMINATION**

**Robotic Sensory Devices**

**Computer Considerations for Robotic Systems**

**More of the Math of Robots**

**Other topics – Safety, New Trends**

**DUE: PROJECT DEMONSTRATIONS AND REPORTS.**

# **HOMEWORK RULES**

**Robotics, Control, DSP, Adv. Math, etc.**

**PLEASE Turn in a paper copy at the beginning of the class.  
Any text should be typed.**

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**EACH DAY LATE            -10 POINTS**

**Unless you e-mail me with a legitimate excuse**

**A WEEK LATE: 30 POINTS MAXIMUM IS YOUR SCORE**

**For all Problems: (-10 points if violated)**

- 1. Briefly describe the problem to be solved before attempting the solution.**
- 2. Show all work.**
- 3. Turn in problems in order**
- 4. Make the results clear (Circle answers, explain results, etc.)**
- 5. When an explanation of the results is requested, the numerical solution will not be sufficient.**

**MATLAB Problems (-10 or more if violated)**

- 1. Write the equations to be solved**
- 2. Describe the solution method (flowchart, description, etc)**
- 3. Comment the MATLAB code**
- 4. Turn in the code and the results (Plots, etc.)**

**Be Neat – if I cannot read the solution – no credit!!**

# Honesty

## Academic Honesty

The Academic Honesty Policy at UHCL (found in the University of Houston-Clear Lake Catalog) states:

Academic honesty is the cornerstone of the academic integrity of the university.

It is the foundation upon which the student builds personal integrity and establishes a standard of personal behavior.

Because honesty and integrity are such important factors in the professional community, you should be aware that failure to perform within the bounds of these ethical standards is sufficient grounds to receive a grade of "F" in this course and be recommended for suspension from UHCL.

The Honesty Code of UHCL states "I will be honest in all my academic activities and will not tolerate dishonesty."

## Learning Outcomes CENG 6533

**Understand the various types and capabilities of robots.**

**Understand how a robot's component parts are used in applications.**

**Describe the mechanical parts of a robot and their characteristics.**

**Understand how a robotic system is controlled and how control parameters are measured or acquired.**

**Describe the sensors of a robot and their characteristics for various applications.**

**Be able to design a computer system architecture to apply to a robotic system.**

**Understand and apply the mathematics used to coordinate a robot's movement.**

**Write a project report according to the directions and give presentations in class.**

Accommodations (as specified by the Americans with Disabilities Act) -  
Suggested statement: If you will require special academic accommodations,  
please contact the [Disability Services Office](#) at 281-283-2627.

Academic Honesty Code: see section 2.1.4 in this handbook for the UHCL  
Academic Honesty Code.