

**ENGR 91 – HUMANOID ROBOTICS
COURSE SYLLABUS****Course Description**

In recent years, humanoid robots such as the Honda Asimo and Boston Dynamics' PetMan have become more prevalent as demand grows for robots that can navigate and work in the same spaces as humans. This project-based course focuses on several topics in the area of humanoid robotics including balancing, legged locomotion, and mobile manipulation. Students will work with detailed computer simulations of the Hubo biped, as well as with one of two Darwin-OP robots in the robotics lab. Successful student projects may be run on a real, human-sized Hubo located at Drexel University.

Instructor Information

Prof. Matt Zucker

Office: Hicks 219 – office hours: Tuesday 2:00 PM - 4:00 PM

Phone: (610) 328-8636

Email: mzucker1@swarthmore.edu

Meeting Time

Hicks 301, Monday, 1:15 PM - 4:15 PM

Prerequisites

Either MATH 027 or 028; one of ENGR 027 or ENGR 028 or CSPC 081. In practice, I expect you to be comfortable writing numerical programs to solve engineering programs. I also expect you to be comfortable with linear algebra concepts such as matrices, rotations and translations.

Reading

There is no textbook for the course; however, there will be assigned readings each week. *You will not pass this course if you do not keep up with the reading.* Once a week (typically, each Tuesday) I will assign response questions to be submitted by the start the following class meeting.

Assignments and grading

In addition to the response questions mentioned above, there will be frequent assignments which are both open ended and programming intensive, as well as a self-directed final project. You may complete assignments in whatever programming language you want, but starter code will typically be distributed in Python.

Assignments may be completed individually, or in groups of two. Instead of a final exam, we will have final project presentations after courses end. Grading will follow approximately the divisions shown below:

- Response questions: 15%
- Class participation: 20%
- Assignments: 45%
- Final project: 20%

Class participation

Since this is a seminar-style course, you will be expected to participate in class discussions. I expect you to arrive to class with questions and comments about the reading for the week. You should also be ready to present the results of your assignments each week as well.

Also, since this class only meets once a week, your attendance counts towards your class participation grade. If you anticipate needing to miss class, please contact me beforehand.

Collaboration policy

- Reading response questions be completed individually.
- Other assignments may be completed individually, or in pairs.
- Although you may discuss the readings and assignments with your classmates, I expect that the work you turn in is your own.
- If you do discuss your solutions with your classmates, I expect you to disclose any such collaboration clearly in your writeups and/or reports. Err on the side of caution – it's the best way to avoid awkward conversations about suspicious similarities between assignments with no attribution of credit.
- Cite any external sources used, including textbooks, web sites, discussions with other professors, etc.

Late policy

Reading responses may not be turned in late.

Other assignments (except the final project) may be turned in up to a week late for half credit. Students get one free late submission without penalty.

I will do my best to accommodate you in extraordinary circumstances. Bear in mind that advance notice of such circumstances is always better.

Webpage and mailing list

The course webpage is at <http://www.swarthmore.edu/NatSci/mzucker1/e91/>. This page will be regularly updated with assignments, projects and reading. You are expected to be responsible for checking for webpage updates in a timely fashion.

You will be automatically subscribed to the course mailing list, which you are also responsible for checking. Throughout the semester, we will use the list to communicate about course information and technical help for programming. The mailing list should not, however, be used to share solutions to homework assignments, projects, or labs. If you're unsure about whether to post something, please email me first.