ENME 489B
MECHATRONICS AND THE INTERNET OF THINGS

Course Syllabus
Spring 2017

Instructor:
Prof. Don DeVoe
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3139 Martin Hall
Office Hours: TBD

Lectures / Labs:
Tu/Th 9:30-10:45
3108 Martin Hall

Online Resources: The course will use Canvas for maintaining the course schedule, assignments, and project materials, and providing a venue for faculty and student communication.

Overview: The field of mechatronics integrates dynamical systems, transducers, computation, control, and design to realize systems where complexity is shifted from mechanical components to the electronic and software domains. This project-driven course will provide a structured hands-on environment to strengthen students' understanding of mechatronics principles introduced in ENME 350/351, and extend these concepts to the "Internet of Things" in which sensors and actuators are embedded into physical objects together with wired or wireless communications, enabling interaction with these objects through the Internet. Students will expand their understanding of the Arduino hardware and software environment, learn about the Raspberry Pi computing platform including the implementation of wireless communication using the Pi, and gain experience with circuit design, layout, and breadboard soldering. Students will then explore predefined and individual student-driven projects combining these skills using both the Arduino and Raspberry Pi platforms.

The course is split into three modules: (1) review of electrical, mechanical, computing, and software systems relevant to mechatronics, (2) hands-on projects integrating a variety of sensor, actuator, computing, and communications technologies into "smart objects", and (3) a student-defined project demonstrating mastery of the course materials.

This is a heavily project-focused course, with grading based entirely on participation and project performance.

Prerequisites: ENME 350/351

Required Textbook: None

Other Required Materials: Arduino, Raspberry Pi, and associated hardware will need to be purchased (approximately $130).

Grading Policy:
- Pre-defined projects 50%
- Student-defined project 50%

Exams: There will be no written exams. Performance on the projects will result in an assessment of interim and final mastery of course materials. Note that in all projects, students will be asked to explain the detailed operation of their hardware and software to demonstrate their full understanding.