University of Wisconsin - Madison
College of Engineering [EGR]
Last Offered: 2015-2016 Spring [1164]
Direct Link to this Syllabus:

1. **E C E 370, Advanced Laboratory**
2. **Credits : 2**  **Contact Hours : 3.0**
3. **Textbook and Materials :** ECE 370 Course Notes

a. **Other Supplemental Materials :** None

- **Specific Course Information :**

a. **Brief description of the content of the course (Course Catalog Description) :**
   Experiments related to the required core material.

b. **Pre-requisites or Co-requisites :** ECE 271, ECE 320, ECE 330, ECE 335, ECE 351

c. **EE- Required**
   CMPE-Selected Elective

- **Specific Goals for the Course :**

a. **Course Outcomes :**

1. The students will design and build a temperature control system using analog hardware
2. They will measure several sensors and choose one appropriate for the system they are designing and building.
3. They will learn how to condition the sensor signal.
4. They will design and build a PID control system to use with the sensor and a peltier cooler for temperature control.
5. The students must also present the design ideas to the class in the form of a product promotion including some of the data that supports the design decisions they made for the product.
6. Once the control system is functioning the students must design a GUI to give a visual
monitor and control capability for the system.

- **ABET Student Learning Outcomes:**

  (a) Ability to apply mathematics, science and engineering principles.
  (b) Ability to design and conduct experiments, analyze and interpret data.
  (c) Ability to design a system, component, or process to meet desired needs.
  (d) Ability to function on multidisciplinary teams.
  (e) Ability to identify, formulate and solve engineering problems.
  (g) Ability to communicate effectively.
  (h) The broad education necessary to understand the impact of engineering solutions in a global and societal context.
  (j) Knowledge of contemporary issues.
  (k) Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

- **Brief List of Topics to be Covered:**

  Temperature Sensors

  Signal Conditioning/Grounding and Interference

  ON/OFF Control Circuitry

  Proportional Control

  LabVIEW

  Computer Interfacing/Input Isolation

  Proportional-integral-derivative (PID) Control

  System Testing

  Report Writing

  Product Review