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

1. **E C E 270, Circuits Laboratory I**
2. **Credits : 1**  **Contact Hours : 2.5**
3. **Textbook and Materials :**

   ECE 270 Lab Manual

a. **Other Supplemental Materials :** None

**Specific Course Information :**

a. **Brief description of the content of the course (Course Catalog Description) :**
   Experiments cover Kirchhoff's laws, inductors, basic operational amplifier circuits, and frequency response.

b. **Pre-requisites or Co-requisites :** ECE 170; ECE 230 or con reg

c. **This is a Required course.**

**Specific Goals for the Course :**

a. **Course Outcomes :**

   1. Measure voltages and currents to verify KVL and KCL, identify shorts and opens in a malfunctioning
   2. Design and build an op amp voltage follower with specified gain and measure the output limiting saturating voltages, the input resistance, and the output resistance
   3. Measure the capacitance of a capacitor, determine the time constant of a simple RC circuit, and design and construct a circuit with a specified time constant
   4. Measure an rms voltage, measure current and voltage and explain what type of values are measured, measure average AC power dissipated by an R-L-C load, and verify that
the individual magnitudes of AC currents do not sum to the measured total magnitudes for parallel loads.

5. Measure the frequency response of a filter; plot a Bode Diagram; select the components for an R-C filter with a specified corner frequency, assemble the circuit, and measure the corner frequency.

- **ABET Student Learning Outcomes:**
  
  (a) Ability to apply mathematics, science and engineering principles.
  (b) Ability to design and conduct experiments, analyze and interpret data.
  (k) Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

- **Brief List of Topics to be Covered:**
  
  1. Basic circuit measurements
  2. Short and open circuits
  3. Assembly of operational amplifier circuits
  4. Inductors and capacitors
  5. AC measurements
  6. Frequency response measurements