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

1. E C E 306, Linear Active Circuits Laboratory
2. Credits : 1  Contact Hours : 3.0
3. Textbook and Materials :

   ECE 306 Lab Manual

a. Other Supplemental Materials : None

• Specific Course Information :

a. Brief description of the content of the course (Course Catalog Description) : Direct coupled and operational amplifier characteristics; applications of feedback; practical aspects.
b. Pre-requisites or Co-requisites : ECE 271; ECE 342 or con reg
c. This is a Selected Elective course.

• Specific Goals for the Course :

a. Course Outcomes :

1. Learn how real op-amps differ from ideal op-amps and what that means to the circuit you are implementing.
2. Understand classic feedback topologies by implementing 2 of the four forms.
3. This yields an understanding of negative feedback and the benefits/cost of it.
4. Implement common collector and common emitter single transistor amplifiers.
5. Understand what the performance capabilities of each amplifier can do for you.
6. Study biasing and performance class AB and class B bipolar transistor output stages.
7. The student will learn about efficiency and thermal issues for these type of output
8. Active filters based on a single op-amp are studied.
9. The student will learn how the individual components that make up several classic filter circuits affect the transfer functions.
10. Sin wave oscillator circuits based on a single op-amp are studied.
11. The student learns how to use R’s, C’s, positive and negative feedback to cause a controlled sinusoidal oscillation.

- **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.
  (e) Ability to identify, formulate and solve engineering problems.
  (k) Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

- **Brief List of Topics to be Covered:**
  1. Integrated circuit operational amplifier
  2. Feedback amplifier
  3. Sine wave oscillators
  4. Low-pass active filters
  5. Negative resistance circuits
  6. Audio frequency power amplifiers
  7. Bench Examination