EC E 305, Semiconductor Properties Laboratory

1. Credits: 1
2. Contact Hours: 3.0

Textbook and Materials:

- ECE 305 Lab Manual
- Other Supplemental Materials: None

Specific Course Information:

- Brief description of the content of the course (Course Catalog Description):
  Introduction to some fundamental properties of semiconductor materials and devices through the use of characterization techniques common in modern electronic industry. These concepts include: charge carriers; energy bands; space charge regions; carrier drift, diffusion and recombination; light emission; and lattice vibrations.

- Pre-requisites or Co-requisites: ECE 271; ECE 335 or con reg

- This is a Selected Elective course.

Specific Goals for the Course:

- Course Outcomes:
  1. Students will learn various measurement techniques used in characterization of semiconductor materials.

- 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.
(g) Ability to communicate effectively.
(k) Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

- **Brief List of Topics to be Covered**:
  1. Optical Characterization of Semiconductors
  2. Optical Gain in Semiconductors: the Semiconductor Diode Laser
  3. C-V Profiling: Electrical Characterization of Semiconductors
  4. Hall Effect
  5. Microelectronic Fabrication: MOS Capacitor
  6. Electrical Characterization of MOS Capacitors