ECE/CHE 613 - Electronic Materials and Characterization

Currently identified as ECE 513 & ChE 573

Catalog Description: Physics and chemistry of electronic materials and methods of materials characterization. Offered alternate years. PREREQs: Graduate standing or instructor approval required. CROSSLISTED: CHE/ECE 613

Credits: 3  Terms Offered: Spring, alternate years

Structure: Three 50-minute lectures or two 80-minute lectures per week.

Prerequisites:
By course: ENFORCED PREREQS: Graduate standing or instructor approval required.
By topic: Other Prerequisites: calculus, basic physics and chemistry

Courses that require this as a prerequisite: none
Instructor: J.F. Wager

Topics
- Resistivity & contact resistance
- Doping density & Schottky barrier heights
- Semiconductor defects
- Semiconductor lifetime
- Semiconductor mobility
- Diodes
- Metal oxide semiconductor (MOS) capacitors
- Field-effect transistors (FETs)
- Optical characterization
- Chemical & physical characterization

Measurable Student Learning Outcomes:
Students are expected to demonstrate the ability to:
1. Give examples of basic issues related to contact resistance, semiconductor defects, minority carrier lifetime, and mobility.
2. Evaluate and compare methods of fundamental electrical characterization of diodes, MOS capacitors, and field-effect transistors.
3. Explain basic operating principles and assess the advantages / disadvantages of analytical measurement techniques related to the optical, chemical, and physical characterization of semiconductors.
Evaluation of Student Performance:
  • 1 midterm, final, 6 homework sets

Learning Resources:

Students with Disabilities:
Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

Link to Statement of Expectations for Student Conduct, i.e., cheating policies
http://oregonstate.edu/admin/stucon/achon.htm

6/23/09