ECE 417 – Basic Semiconductor Devices

Catalog Description: Theory and operation of pn junctions, bipolar transistors, and MOSFETs.

Credits: 3 **Terms Offered:** Fall

Prerequisites: ENGR 317

Courses that require this as a prerequisite: None

Structure: Two 80-minute lectures per week

Instructors: J. Wager (primary), A. Jander (secondary)

Course Content:
- Semiconductor fundamentals
- PN junctions
- BJTs
- FETs

Measurable Student Learning Outcomes:
At the completion of the course, students will be able to…
1. **Analyze** PN junction, bipolar transistor, and MOSFET operation using energy band diagrams (ABET Outcomes a, e, m)
2. **Qualitative and quantitative assessment** of the electrostatics of one-dimensional semiconductor devices (ABET Outcomes a, e, m)
3. **Employ** current-voltage (I-V) and capacitance-voltage (C-V) characteristics in the assessment of pn junctions, bipolar transistors, and MOSFETs (ABET Outcomes a, e, m)
4. **Prepare** two reports on projects involving the design/analysis of semiconductor devices using computer-aided design tools (ABET Outcomes a, c, e, g, k, m, p)

Learning Resources:
- *Semiconductor Device Fundamentals,* R.F. Pierret, Addison Wesley, 1996

Students with Disabilities:
Accommodations are collaborative efforts between students, faculty and Services for Students with Disabilities (SSD). Students with accommodations approved through SSD 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 SSD should contact SSD immediately at 737-4098.

Link to Statement of Expectations for Student Conduct:
http://oregonstate.edu/admin/stucon/achon.htm

Revised: 10/23/07