

Southern Illinois University at Carbondale
Spring 2013
Syllabus: ECE447 Semiconductor Devices

Instructor:

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Office Hours: MW 1:00–3:00 PM, and by appointment

Lecture: MWF 3:00–3:50 PM, Engineering A Wing Room 220

Labs: online simulations on nanoHUB.org and Sentaurus commercial simulator

Prerequisite: ECE 345

Textbook: Solid State Electronic Devices, 6th edition, by Ben Streetman and Sanjay Banerjee, ISBN# 9780131497269.

Other Useful Books/Resources:

(1) Semiconductor Physics and Devices, 3rd edition, by Donald A. Naemen, McGraw Hill, ISBN# 0-07-232107-5

(2) Online book: <http://ecee.colorado.edu/~bart/book/>

Course Topics (Tentative):

Introduction: Device industry, figures-of-merit {2 classes}
Atoms and electrons, basic quantum mechanics {4 classes}
Crystal properties and energy bands {2 classes}
Carrier statistics {3 classes}
Carrier transport mechanisms and phenomena {3 classes}
PN diodes {4 classes}
Field-effect transistors {10 classes}
Bipolar junction transistors {6 classes}
Optoelectronic devices {4 classes}
Integrated circuits {2 classes}

Evaluation (Tentative):

5 short tests	40%
Homework	20%
Final Exam	25%
Lab	15%

Note:

1. Students are responsible for all announcements made in the class and posted on SIUC's webCT (blackboard).
2. Class materials and HWs will be posted on SIUC's D2L portal.
3. Emphasis will be given on the *conceptual understanding* of the subject-matter rather than on memorization of equations.