# EEE 436/591, Fundamentals of Solid State Devices, Fall 2009

Time and Place of Lectures: 3:00-4:15pm TTh, LL 60

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Course Website: http://chaos1.la.asu.edu/~yclai/EEE436.html

Office Hours: 4:20-5:30pm TTh and by appointment, GWC610

**Prerequisites**

EEE 352 or equivalent; knowledge of elementary quantum mechanics, a basic understanding of solids (e.g., band diagrams, Fermi level, electron gas and conduction in metals, phonons, etc.).

**Text**

R. F. Pierret, Semiconductor Device Fundamentals, Addison-Wesley, 1996

**Description**

The objective of this course is an understanding of the operation of semiconductor devices. To understand device operations, one needs not only some knowledge of elementary quantum mechanics, but also a basic understanding of concepts from solid-state physics such as energy bands, carrier statistics, carrier drift and diffusion, etc. The first part of the course will be spent on these topics. The second part of the course will deal with basic semiconductor devices: PN junctions, metal-semiconductor junctions, and field-effect junctions. The emphasis will be on the conceptual understanding of device physics rather than on memorization of equations.

**Topics**

Semiconductor fundamentals, PN junctions, metal-semiconductor devices, and field-effect devices.

**Student responsibilities**

1. Attending classes;
2. Reading textbook;
3. Completing and turning in homework assignments in time (about 10 times - 10%) - - *Late homeworks will not be accepted.*
4. Two midterm exams (25% each):
   - First exam on **Thursday, October 1**;
   - Second exam on **Tuesday, November 3**;
   - **no make-up exams**.
5. Final exam (40%) on **Thursday, December 10, 12:10-2:00pm - - no make-up exam**.