ELECTRONICS LAB

EECS170LA, Fall 2011

**Goal and Description:** Laboratory accompanying EECS170A for students to improve experimental skills and enhance the understanding of lecture materials by conducting hand-on experiments. The experiments focus on semiconductor material properties, semiconductor device physics and operation principles, transistor switches and transistor amplifiers. (1 Units)

**Prerequisites**: EECS70A, EECS 70B and Physics 7D

**Co-requisite:** Physics 7E and EECS170A

**Manual:** Available at the engineering copy center

**References:** Robert F. Pierret, *Semiconductor Device Fundamentals*, Addison-Wesley, 1996.

D.A. Neamen, Semiconductor physics and Devices, 3rd Ed., McGraw Hill,

Anderson and Anderson, *Fundamentals of Semiconductor Devices*, McGraw-Hill, 2005

B. Streetman and S. K. Banerjee, *Solid State Electronic Devices*, Prentice Hall, 2006

**Instructor:** Peter Burke

**TAs:** Nima Rouhi, [nrouhi@uci.edu](mailto:nrouhi@uci.edu)

**& T.**B.D.

**Lab Location:** MSTB 224/222

**Experiments:**

1. Introduction to the lab and equipments
2. Soldering technology and RC filters
3. Characterization of semiconductors
4. Characterization of p-n junction and Schottky diodes
5. Transient response of diodes and rectifier design
6. Characterization of bipolar junction transistors and MOSFETs
7. Bipolar junction and MOS transistors and switches
8. Bipolar junction transistor amplifiers

**Course Objectives and Outcomes:** Students will:

• learn how to use modern electronic test and measurement equipments

• learn how to characterize diodes and transistors

• learn how to build a basic electronic circuit and measure its characteristics

• learn how to analyze and design single stage transistor amplifiers

• be capable of designing, building and testing a single-stage transistor amplifier at the end of the course

**Grading Criteria:**

Lab Reports: 45% (due following week of each lab)

Hands on lab exam: 10% (probably during final lab session)

Lab Exam: 45% (in class)