

Integrated Circuit Design and Fabrication
Electrical and Computer Engineering Department
University of California, Santa Barbara

This course is a continuation of ECE 124B Integrated Circuit Design and Fabrication. We will focus on the sound understanding of solid state devices for integrated circuits as well as semiconductor processing techniques. Specifically, we will study p-n junctions, MOS, and bipolar transistors. We will also discuss CMOS and BiCMOS technologies, which are the basic building blocks of VLSI integrated circuits. There is also a laboratory associated with this course which will give you hands on experience in integrated circuit design, processing, and characterization. In the laboratory, you will design a simple circuit, fabricate it, and test it.

Topics to be covered

- MOS Transistors
- p-n junctions
- Bipolar Transistors
- VLSI technologies
- Advanced processing techniques

Prerequisite: ECE 132 and ECE 124B or equivalent or consent of the instructor

Instructor: Ilan Ben-Yaacov, Room 5120A, Engineering I, ext. 3812+211, ilan@engineering.ucsb.edu

Time: Tuesday and Thursday 2:00-3:15 p.m.

Place: GIRV 2135

Text: Device Electronics for Integrated Circuits, by Richard S. Muller and Theodore I. Kamins. Published by John Wiley & Sons. 3rd edition, 2002. TK7871.85 .M825 2002

Handouts and class notes will complement the text.

Course Format: There will be homework assignments, a midterm, a presentation, and laboratory work. Laboratory work will consist of designing, fabricating, and testing of something interesting, such as a simple MOS circuit. You will design a process sequence using L-Edit software by Tanner EDA, simulate the device characteristics and circuit performance, and compare it with your experimental results. Homework, midterm, presentation, and laboratory will each contribute 20%, 20%, 20%, and 40% to the final grade. The laboratory will consist of a final report and a presentation to the class.

Office Hours: Office hours are TR 3:30-4:30 p.m. or by appointment, or just stop by. I am around most days.

Teaching Assistant: Shouxuan Xie, sxie@engineering.ucsb.edu, office hours TBA

Class Web Page: http://my.ece.ucsb.edu/ilan/Classes/ECE124C/ece_124c_spring_2004.htm

Lab Supervisor: Martin Vandenbroek, Room 4110, Engineering I, ext. 4142, mav@ece.ucsb.edu