Course Syllabus

ECE 124C  Integrated Circuit Design and Fabrication  (Elective)  4 units

Catalog Description:
Design, simulation, fabrication, and characterization of NMOS integrated circuits. Circuit design and layout is performed using commercial layout software. Circuits are fabricated using modern VLSI processing techniques. Circuit and discrete device electrical performance are analyzed.

Prerequisites:
ECE 12B 4B and 137A with a minimum grade of C-.

Text, References, and Software:

Topics Covered and Course Goals:

1. Apply concepts learned in ECE 124B and ECE 137A to design, layout, fabricate, and test an integrated circuit. Students, working in groups of 4-5, design and fabricate a circuit which is compatible with silicon NMOS process. Mask layout is performed using commercial layout software, such as L-Edit. Masks based on students’ designs are ordered, and students fabricate their circuits in the UCSB educational cleanroom using NMOS process learned in ECE 124B. Completed circuits and test structures are then electrically characterized.

2. Project results are documented in a well-organized and complete final report, and each group gives a 30 minute oral presentation to the class on their projects.

3. Understand the fundamentals of JFET, MESFET, HFET, and HBT semiconductor transistors.

4. Understand how the characteristics of discrete electronic devices (i.e. transistors, diodes) affects the performance of the circuits they comprise, and how advanced structure design (i.e. heterostructures) and processing can improve these characteristics.

Class/Laboratory Hours:
Lecture 4 hours, Laboratory 3 hours
**Contribution to Criterion 5**

**Contribution to Program Outcomes:**

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**Prepared by:** Ilan Ben-Yaacov  
**Date:** April 27, 2008