UNIVERSITY OF CALIFORNIA
College of Engineering
Department of Electrical Engineering and Computer Sciences

Professor Ali Javey
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MICROFABRICATION TECHNOLOGY
EECS143, Spring 2009

T.A.s:
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LECTURES
Tu-Th 3:30-5 pm, 3106 Etcheverry

LAB SECTIONS
Lab location: 218 Cory

M 2-5P
Tu 10-1P
W 2-5P
Th 11-2P
F 9-12P
F 2-5P

Each student must attend one of these laboratory sections

OFFICE HOUR
Professor Javey: W 10-11 am, 506 Cory
- T.A.s’ office hour will be announced on EE143 homepage.

TEXT
Introduction to Microelectronic Fabrication
R. C. Jaeger
Prentice Hall

REFERENCES (On reserve at the Engineering Library)
Semiconductor Device Fundamentals
R. F. Pierret
Addison Wesley

Device Electronics for Integrated Circuits
R. S. Muller and T. I. Kamins
Wiley
COURSE DESCRIPTION
EE143 teaches the fundamentals of integrated-circuit (IC) fabrication and surface-micromachining technology, giving the student a basic understanding of IC and micromachining processes and the effect of processing choices on device performance. Students learn to use process simulation tools and also fabricate and characterize devices in the laboratory. This lecture part will cover the processing techniques and design methodologies of microfabrication. We will discuss the process modules: lithography, thermal oxidation, diffusion, ion implantation, etching, thin-film deposition, epitaxy, metallization. The second part of the course will cover process simulation, layout design rules, MOS, IC, and MEMS process integration. The laboratory part of the course will provide students opportunities to have hands-on experience to fabricate and characterize a NMOS chip with simple MEMS components.

PREREQUISITES
EE40/E100 and Physics 7B or equivalent

CONTENTS:
- Introduction to Materials and Processing (1-2 weeks)
- Photolithography (1 week)
- Etching (1 week)
- Oxidation (1 week)
- Deposition (1 week)
- Diffusion (1 week)
- Ion Implantation (1 week)
- Metallization/CMP (1 week)
- Simulation/Layout (1 week)
- Process Integration (1 week)
- Introduction to Devices (2 weeks)
- Nanolithography and Nanofabrication (1 week)

HOMEWORK, EXAM & GRADES
Percentages are as follows:
- Homework: 5%
- Two Exams: 30% (15% each)
- Lab (quizzes, lab work, reports): 35%
- Final Exam: 30%

Exam 1: February 24, 2009
Exam 2: April 16, 2009
GRADING POLICY

We will follow the EECS grading guidelines for this class:

“A typical GPA for courses in the upper division is 2.9. (This GPA would result, for example, from 23% A's, 50% B's, 20% C's, 5% D's, and 2% F's.) A class whose GPA falls outside the range 2.7 - 3.1 should be considered atypical. A typical GPA for basic prerequisite upper division courses (EECS 104A, EECS 105, CS 150, CS 153) is 2.7 with GPA's outside the range 2.5 - 2.9 considered atypical.”

http://www.eecs.berkeley.edu/Policies/ugrad.grading.shtml

EECS Department Policy on Academic Dishonesty:
http://www.eecs.berkeley.edu/Policies/acad.dis.shtml

EE 143 Home Page:
http://www-inst.eecs.berkeley.edu/~ee143/