

UNIVERSITY OF CALIFORNIA
Department of Electrical Engineering and Computer Sciences

Professor Ali Javey
550B Cory Hall, ajavey@berkeley.edu

MICROFABRICATION TECHNOLOGY
EE143, Spring 2016

T.A.s:

Peida (Peter) Zhao (infinetexh@gmail.com)
Mark Hettick (markhettick@gmail.com)

LECTURES

Tu/Th 3:30-5 pm, 3113 ETCHEVERRY

LAB SECTIONS

Lab location: 218 Cory

M 9-12 pm

Tu 9-12pm (Cancelled)

W 9-12 pm (Cancelled)

W 1-4 pm

F 9-12 pm

Each student must attend one of these laboratory sections

COURSE WEB SITE: bcourses

OFFICE HOUR

Professor Javey: F 3-4 pm, 550B Cory Hall

- T.A.s' office hour will be announced on EE143 homepage.

TEXT

Introduction to Microelectronic Fabrication

R. C. Jaeger

Prentice Hall

REFERENCES

Modern Semiconductor Devices for Integrated Circuits

C. C. Hu

<http://www.eecs.berkeley.edu/~hu/Book-Chapters-and-Lecture-Slides-download.html>

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 (2 weeks)
- Etching (1 week)
- Oxidation (1 week)
- Deposition (1 week)
- Diffusion (1 week)
- Ion Implantation (1 week)
- Metallization/CMP (1 week)
- Process Integration (throughout)
- Introduction to Devices (2 weeks)

EXAMS & GRADES

Percentages are as follows:

Two Exams	30% (15% each)
Lab (quizzes, lab work, reports)	35%
HWs	5%
Final Exam	30%

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>