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

EE 105: MICROELECTRONIC DEVICES AND CIRCUITS

https://bcourses.berkeley.edu/

Fall 2015 Prof. Ming Wu

Professor: Ming C. Wu, wu@eecs.berkeley.edu, Office: 511 SDH
GSIs: Seth Fortuna, fortuna@eecs.berkeley.edu (20 hr GSI)
Kevin Messer, kmesser@eecs.berkeley.edu (10 hr GSI)

Objective:
Provide a basic understanding of semiconductor devices and integrated circuits:

- Ideal and non-ideal Op Amplifiers
- Basic device concepts of p-n junction diode, bipolar junction transistors (BJT), and field effect transistors (FET) and their SPICE models
- Single transistor amplifiers
- Biasing circuits for amplifiers
- Input/output impedances of various amplifiers
- Multi-stage amplifiers
- Frequency response and bandwidth of amplifiers

Prerequisite:
KVL and KCL, node-voltage analysis, Thevenin and Norton equivalent circuits, design and analysis of circuits with operational amplifiers, impedance, time domain analysis, frequency response (Bode plots), analog vs. digital signals, laboratory techniques (breadboarding and operation of supplies, DVM, oscilloscope, function generator). These materials are covered in EE 40 or EE16A/B.

Relation to Other Courses:
EE105 is a prerequisite for EE140 (Linear Integrated Circuits) and EE142 (Integrated Circuits for Communications). It is also helpful (but not required) for EE130 (Integrated Circuit Devices) and EE141 (Introduction to Digital Integrated Circuits).

Textbook: *Sedra/Smith, Microelectronic Circuits,* Oxford University Press, 2014 (7^{th} Ed)

Lectures: Tuesdays, Thursdays 3:40 to 5:00 pm @ 3106 Etcheverry

Discussion Sections:

Section 101 (3113 Etcheverry):	Mondays 9-10 am
Section 102 (247 Cory):	Wednesdays 1-2 pm

Office Hours:

Ming C. Wu: (511 SDH):	Monday 2-3 pm; Thursday 5-6 pm

Labs:

Students should attend the Lab section they are enrolled in. All of the lab assignments – along with helpful tutorials -- are posted online under Labs. Each pre-lab assignment is due at the beginning of the corresponding lab session. Post-lab assignments are due at the beginning of the following lab session. Although students will be allowed to work in pairs during the lab sessions, each student must individually turn in his/her own pre-lab and post-lab assignments.

* You must turn in the Lab Report on time. Late report will be discounted by 50%.

Homework:
Weekly assignments will be posted online on Mondays. They are due the following Monday at 5 pm. Turn in your homeworks at EE105 Drop box in Cory Hall (near TI Lab). Late homework will not be accepted.
You may discuss homework problems with other students in the class, the GSIs, or the instructor. However, the work you submit for grading must be your own.

Midterms:
Two midterms (80 minutes each) will be given in class. These are intended to gauge the student's understanding of the basic concepts covered in the course. Some numerical calculations might be required (*i.e.* do bring your calculator). All exams will be closed book (with 2 pages of cheat sheets).

Final Exam:
The final exam will be closed book, with 4 pages of notes allowed. Students will need to bring a calculator. The final exam will be given on **Friday 12/18 from 7-10 pm**. No early final exam will be offered.

Grading:
Your grade will be computed from a weighted average of

Homework: 10% (with lowest score dropped from grade calculation)
Lab: 30% (You must complete all labs to pass the course!)
Midterms: 15% each
Final Exam: 30%

Academic Dishonesty:
See Department policy at http://www.eecs.berkeley.edu/Policies/acad.dis.shtml
Cheating will result in automatic Fail. Copying homeworks or lab reports is considered cheating.

Course Accommodations:
Students may request accommodation of religious creed, disabilities, and other special circumstances. Please make an appointment with Prof. Wu to discuss your request before the end of second week (Sept. 5), so that he can plan accordingly in advance.

Classroom Etiquette:
- Arrive in class on time!
- Bring your own copy of the lecture notes (posted online by 7AM on the day of the lecture).
- Turn off cell phones.
- No distracting conversations -- relevant questions are encouraged