

EEE303 Microelectronics I and Experiments

Fall 2021

Instructor: Prof. Seong-Jin Kim, Dept. of Electrical Engineering

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Classroom: On-line lecture (Zoom link is announced in the BB)

Class hours: 1:00~2:15pm on Tuesday and Thursday

Office hours: 10:00~11:30am on Tuesday or appointment-basis

Teaching Assistants

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Course Objectives

To provide the fundamentals of microelectronics from the semiconductor device physics to the analysis techniques of analog circuits with nonlinear devices

Textbook: Behzad Razavi, Microelectronics, 2nd ed

Grading: Attendance 10%, Homework 12%, Lab 24%, Midterm 24%, Final 30%

Attendance

Your class attendance will count for 10% of grading. If you have some special reason not to come to the class, you have to notice it in advance. More than 2 missing classes will give you penalty as follows.

Absence	0 ~ 2	3	4	5	6	7	8
Penalty	0%	-1%	-2%	-4%	-6%	-8%	-10%

Being late twice will be regarded as being absent once. If you don't bring the ID card or find out your missing in the attendance check system, you must let me know it within the day. Other requests will be ignored.

Homework

A recommended problem set from each chapter will be given. You can solve it, but you don't need to submit your solution basically. It is encouraged for you to discuss with your friends. Six assignments will be given as homework, which includes 3 problems from the problem set. Each of them counts for 2%.

Experiment Class

Six experiments dealing with diode and bipolar transistors will be given. Each lab includes pre and main labs. You should run LTspice in the pre-lab and conduct an experiment in the main lab.

Due to COVID-19 situation, it is not allowed to have off-line lab sessions during or after the semester. It is not possible to conduct experiments by yourselves at home, either. Instead, demo video clips with experiments conducted by TA will be given to you. You should watch them and put together pre and main reports.

Grade

It will not be either 100% relative or 100% absolute evaluation, but somewhere in between them. However, the absolute evaluation is much preferred so that you don't need to concern your relative ranking basically. Neither objections nor negotiations about the grade after the course will be accepted.

Course Schedule

- Week 1: Introduction to Microelectronics (Ch 1)
- Week 2: Review of Basic Circuit Theory
- Week 3: Basic Physics of Semiconductors (Ch 2), Lab 1
- Week 4: Basic Physics of Semiconductors (Ch 2)
- Week 5: Diode Models and Circuits (Ch 3), Lab 2
- Week 6: Physics of Bipolar Transistors (Ch 4)
- Week 7: Bipolar Amplifiers (Ch 5)
- Week 8: Midterm Exam
- Week 9: Bipolar Amplifiers (Ch 5), Lab 3
- Week 10: Bipolar Amplifiers (Ch 5)
- Week 11: Physics of MOS Transistors (Ch 6), Lab 4
- Week 12: CMOS Amplifiers (Ch 7)

Week 13: Operational Amplifier as a Black Box (Ch 8), Lab 5

Week 14: Cascode Stages and Current Mirrors (Ch 9)

Week 15: Cascode Stages and Current Mirrors (Ch 9), Lab 6

Week 16: Final Exam