CMPE 314 Principles of Electronic Circuits

Fall 2016 Lecture: Tu, Th 2:30 – 3:45 pm
Lab: Th 9:00 am – 11:00 am, 11:00 am – 1:00 pm

Classrooms: University Center 115 (lecture); ITE 242 (lab)

Instructor: Prof. Li Yan
ITE 315, x3558, liyan@umbc.edu
Office Hours: M, W 2:30 – 3:30 pm, or by appointment

Textbook: Electronics Circuit Analysis and Design, 4th Ed., by Donald A. Neamen (McGraw-Hill)

Prerequisite: CMPE 306

Course Description:

A brief overview of semi-conductor devices and technology. The basic physical operation of PN-junction diodes, junction field effect transistors, MOSFETs and bipolar transistors. The corresponding small signal AC models. Basic transistor circuit configurations (CE, CC CB, CS, CD, CG). DC bias. Small signal analysis. Simple multi-transistor circuits: diffamp, operational amplifier and current mirror frequency response. In addition to the lectures, there is a laboratory associated with the course. Prerequisite: CMPE 306

Grading:

20%	labs
10%	homework assignments
15%	midterm test 1
20%	midterm test 2
35%	final exam

Course Goals

7. Students will understand the operation and use of PN-junction diodes.
8. Students will understand the operation and use of Field-Effect Transistors (FETs)
9. Students will understand the operation and use of bipolar transistors.
10. Students will be able to apply the basic small signal AC models to the various types of transistors and will be able to conduct small signal analysis as appropriate.
11. Students will be able to analyze simple multi-transistor circuits.
12. Students will understand basic frequency response of transistor circuits.

Class Policies:

Completion of all laboratory projects is mandatory. Missing of any lab project will result in, at the least, a grade of I (incomplete). Late homework and lab reports will not be accepted. Follow the lab policies.

Subjects and Approximate Schedule:

Week 1	(9/01)	semiconductors,	
Week 2	(9/06 9/08)	p-n junction diode characteristics and model	Lab-0
Week 3	(9/13, 9/15)	rectifier circuit, Zener diode circuit	Lab-1
Week 4	(9/20, 9/22)	clipper and clamper circuits	Lab-2
Week 5	(9/27, 9/29)	bipolar junction transistors, DC analysis	Lab-3
Week 6	(10/04, 10/06)	DC biasing, midterm exam 1	
Week 7	(10/11, 10/13)	small signal hybrid-π model, AC analysis	Lab-4
Week 8	(10/18, 10/20)	BJT amplifier circuits	Lab-5
Week 9	(10/25, 10/27)	multi-transistor circuits	Lab-6
Week 10	(11/01, 11/03)	field effect transistors, DC analysis	Lab project
Week 11	(11/08, 11/10)	small signal AC model, midterm exam 2	Lab project
Week 12	(11/15, 11/17)	FET amplifier circuits	Lab project
Week 13	(11/22,)	active loads, multi-transistor circuits	
Week 14	(11/29, 12/01)	frequency response	Lab project
Week 15	(12/06, 12/08)	applications	Lab final
Week 16	(12/13 12/15)	Review, final exam	

Student Academic Integrity

"By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are to be held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Policy, consult the UMBC Student Handbook, the Faculty Handbook, or the UMBC Policies section of the UMBC Directory."

You may study together. You must do your own work and not copy from anyone else or from the solutions obtained elsewhere! Copying will result in zero points and cheating on the exams will be reported to the department and university.