EE 321 Analog Electronics

Course title:
Analog Electronics

Class hours:
Monday, Wednesday, Friday 11:00-11:50

Office hours:
TBD

Instructor:
Dr. Anders M. Jorgensen
Workman 227
Phone: 505-835-5450
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Classroom location:
Workman 109

Textbook:

- *Adel S. Sedra and Kenneth C. Smith*, Microelectronics Circuits, Fifth edition, Oxford University Press.

Learning objectives:

1. You will learn the physical principles behind several analog electronic components.
2. You will learn the characteristics of amplifiers, diodes, Field effect transistors (FETs), and Bipolar Junction Transistors (BJTs).
3. You will learn how to design and analyze circuits containing one or more of these components.
4. In the accompanying laboratory exercises you will receive practical experience in building circuits with these components.

Prerequisites:

EE 212 and 212L (Circuits and Signals II).
Physics 122 or 132 (General physics II).
EE 321 and 321L are co-requisites of each other.

Topics covered:
In this course we will explore the physics behind modern semiconductor devices and learn how to use them in electronic circuits including as signal amplifiers and switches. The specific topics that we will cover are

1. Amplifiers, models, circuits, data sheets.
2. The PN junction, diodes, models, data sheets.
3. Zener diodes, and other types of diodes.
4. Field effect transistors (FETs)
5. Biasing FETs.
6. Designing amplifiers using FETs.
7. Bipolar junction transistors (BJTs)
8. Biasing BJTs
9. Designing amplifiers using BJTs

Course work:

1. Reading. You will be required to keep up with the course by reading the assigned sections in the books and writing reading summaries.
2. Active participation in class. Show up and respond to questions.
3. Homework. Assigned approximately weekly.
4. Exams. There will be a total of four exams during the semester.

Grading policy:

1. Active participation in class 10%
2. Reading summaries 10%
3. Homework 20%
4. Four exams 60%

Approximate Lecture Schedule:

Week of	Lecture	Exam
Aug 27	Amplifiers	
Sep 1	Circuit models of amplifiers, frequency response	
Sep 8	Inverting and non-inverting amplifiers	
Sep 15	Difference amplifiers, feedback	
Sep 22	Integrators and differentiators	1
Sep 29	Diodes I-V characteristics	
Oct 6	Zener and other types of diodes	
Oct 13	MOSFETs and I-V characteristics	
Oct 20	MOSFETs and DC operation	2
Oct 27	MOSFETs as amplifiers	
Nov 3	Bipolar Junction Transistors (BJTs)	
Nov 10	BJT as amplifiers and switches	
Nov 17	BJT small signal operation	3
Nov 24	Current mirrors	
Dec 1	Amplifiers with active loads	
Dec 8	Review	4