

EE 321 Analog Electronics Fall 2012

Course title:

Analog Electronics

Office hours:

TBD

Class hours:

M 11-11:50, W 11-11:50, F 11-11:50

Laboratory hours:

T 14-16:45

Instructor:

Dr. Anders M. Jorgensen

Workman 227

Phone: 505-835-5450

e-mail: anders@nmt.edu

Classroom location:

Workman 109

Laboratory location:

Workman 183

Textbook:

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

Learning objectives:

1. You will learn about non-linear circuit elements such as diodes, Bipolar Junction Transistors (BJTs), and Metal Oxide Semiconductor Field Effect Transistors (MOSFETs).
2. You will learn to model, analyze, and build circuits containing non-linear circuit elements.
3. You will learn about non-ideal properties of operational amplifiers and how to take those into account when analyzing and building circuits.
4. In the accompanying laboratory exercises you will gain hands-on experience building and operating all of these devices.

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 modern semiconductor devices such as BJTs and MOSFETs and learn how to use them to in electronics circuits including as signal amplifiers and switches. The specific topics that we will cover are

1. Amplifiers, models, circuits, data sheets.
2. Diodes, models, data sheets.
3. Zener diodes, and other types of diodes.
4. Bipolar junction transistors (BJTs)

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| 5. Biasing BJTs | 8. Biasing FETs. |
| 6. Designing amplifiers using BJTs | |
| 7. Field effect transistors (FETs) | 9. Designing amplifiers using FETs. |

Course work:

1. Reading. Stay current with assigned sections in the textbook.
2. Active participation in class. Show up, respond to questions, ask questions.
3. Homework. Turn in homework in class on the weekly due date.
4. Exams. Take exams. Three highest exam scores will be counted.
5. Laboratory exercises. Adequate preparation, prelabs when required, complete assignment in allotted time.

Grading policy:

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| EE 321 | EE 321L |
| 1. Homework: 40%. | 1. Weekly labs: 100% |
| 2. Four exams: 60%. The lowest exam score is dropped. | 2. One lab grade is dropped |

There will be no make-up opportunities for class work. The lowest exam and lab scores are dropped allowing you to miss once or to improve your score as you choose.

Approximate Schedule (subject to change, see website for actual schedule):

Week of	Lecture	Exam	Labs
Aug 21	Amplifiers		
Aug 27	Operational amplifier and imperfections		
Sep 3	Ideal diode and junction diode		1
Sep 10	Diode circuits		2
Sep 17	Zener diodes and rectifiers		3
Sep 24	Introduction to BJTs	1	4
Oct 1	BJT IV characteristics		5
Oct 8	BJT DC characteristics and biasing		6
Oct 15	BJT small-signal models and amplifiers		7
Oct 22	BJT circuits		8
Oct 29	BJT amplifiers	2	9
Nov 5	MOSFETs		10
Nov 12	MOSFET circuits		11
Nov 19	MOSFET small-signal models and amplifiers		12
Nov 26	MOSFET amplifiers	3	