

ANALOG AND DIGITAL ELECTRONICS

Spring 2018

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Office:	N169
Office Hours:	Monday 11:00 to 11:45, Tuesday 10:00 to 11:30, Other times by appointment
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Course Description

This introductory course will cover the basics of electronics and instrumentation. I will provide notes for your “text”. If you want an inexpensive text try Curtis Meyer’s book *Basic Electronics: An Introduction to Electronics for Science Students* at <http://stores.lulu.com/curtisameyer>. Meyer’s book is fair introductory text. Horowitz and Hill’s *Art of Electronics* 3rd Ed. is a very good book on electronics and worth having if you’re interested in electronic instrumentation. However it is difficult for an introductory book. It is better if you have had some electronics before reading it. Snoke’s *Electronics a Physical Approach* is good, but assumes you are at a senior level. It’s also more expensive, but covers a lot of material.

To cover topics in circuit analysis properly would require a background in complex variables and some understanding of Laplace or Fourier transforms and their use in differential equations. However, neither of these is a prerequisite so I will go 'light' on this material and try to stay with complex algebra. However, you will need to know the rudiments of complex algebra at a Precalculus level. I will try to make this course more conceptual and less mathematical, but there is a moderate amount of math involved.

I will try to spend some time on instrumentation and measurement techniques in addition to covering the fundamentals of electronics. Many measurements techniques in experimental Physics involve a significant amount of electronics. We want you to learn some electronics so you can better understand these measurement techniques. The difficulty is time. In a one semester course it is difficult to cover as much as one would like. However, it is a beginning and should prepare you to learn more on your own.

Grading

I plan to give two or three midterms (100 points each) and a final (150 points). I will also give homework and grade it. The homework will count for 15% of your grade.

The labs are important and they will count for 25% of your grade. However, labs are difficult to grade. The important point is that you attend and DO ALL of the labs. The write-ups will not be extensive, but I do want a record of what you did and what you saw. (Dr. To will discuss the labs in more detail in the first lab.) In effect the exam scores will be about 60% of your grade, with the labs about 25% and the homework about 15%. However, to pass the course with a C- or better, you must pass the lecture part of the course, i.e. Exams & Homework, with at least a 62% average.

Grade	%
A	90-100
B	78-89
C	65-77
D	50-64

Your grade in the course will be based on your total number of points. The cutoffs are approximately as shown at the right. **I will use +/- grading.**

I encourage you to work together. I do not want you to copy another person's work, but it often helps to discuss the problems and the course material with other students. It is a good learning experience to try to explain the material to another person and it usually is more fun when you work with other people.

A good practice is to read the homework questions and then read the chapter **BEFORE** I lecture on it. Then come to the lecture and make sure the questions you have from your reading are answered in the lecture. You need to keep up in the course.