

ECE112 - An Introduction to Electrical Engineering

Introduction

ECE112 is an introduction to electrical engineering concepts done in the context of simple, hands-on student-constructed projects. Topics are introduced when they make sense and find application within the projects. Constructing multiple projects also allows those who may be *tinkering deprived* to gain valuable experience and gain confidence that they can build electronic projects as well as anyone else.

Where possible, the approach taken is *intuition first*. An appeal is first made to what we know of the physical world and a bridge is built to the more abstract theory. Considerable use of *water models* will be made.

Topics covered in ECE112

- Electrons, current, voltage, and basic definitions
- Circuit elements and schematic diagrams
- Resistors and Ohm's Law
- Resistors in parallel and series
- Modeling circuits with independent voltage and current sources
- Power calculations
- Circuit analysis with Kirchoff's current and voltage laws
- Circuit simulation with SPICE
- Diode and transistor circuits
- Use of Linux and software tools
- Terminal behavior of inductors and capacitors

Evaluation and Grading

- Sometimes challenging but not real hard material,...it should be fun!
- You must do the reading before class or you'll be lost
- You must do the homework, or else...
- Tests may resemble homework but will not be *just like*
- Most likely will have 2 midterms, 1 final
- Lab is a major part of your grade, enjoy it!

Class Operation

I will be following a somewhat *inverted* class paradigm. I will not spend much time lecturing over the reading material. I will summarize, covering only the most important points. If you don't do the reading beforehand, you will be lost. The bulk of class will be spent working problems in class. You will be working the problems. You will not be watching me work the problems. You learn by doing, not by watching.

I may have you do a problem in class to turn in for credit. If so, you will work in groups of three (optimal) or four. You will all receive the same grade on this work. As with all grading in the course, the emphasis is on clear thinking, correct procedure, and neat work; not just correct answers.

I will assign about ten *suggested* homework problems each week. These are not graded. The solutions are posted. Work problems until you are completely comfortable with them. If you want more problems, make up some of your own. This is a good learning technique. If you can do the problems, without help, without looking at the solution first, you will probably do well on the tests. If you don't master the homework problems, I can almost promise that you will not pass the course.