Physics 29A, Electronics Laboratory, Syllabus

Summary

An introduction to analog and digital electronic circuits. Six scheduled hours a week, including one lecture and one quiz. Most scheduled time is spent in the electronics laboratory assembling and testing electronic circuits. Students should expect to spend another six hours outside class studying the material, preparing for the quiz, and consulting the instructors with their questions. Office hours and additional laboratory time will be available.

Topics

Voltage, Current, and Resistors                  Capacitors, Inductors, and Impedance
Frequency Response and Step Response            Diodes and Rectification
Transformers and Power Supplies                 Transistors and Audio Amplifiers
Amplitude-Modulated Radio Reception            Operational Amplifiers
Combinatorial Logic                             Oscillators and Clocks
Registers and Counters                         Analog to Digital Conversion

Tools

Notes: Lecture notes to accompany the course will be available on Latte a few days before each lecture, along with previous quiz questions for practice.

This course has no required text book. We recommend *The Art of Electronics* by Horowitz and Hill (any edition) as an electronics reference book that will prove valuable in the long term. We recommend *Basic Electronics: An Introduction to Electronics for Science Students* by Curtis Meyer (2nd Edition, from www.lulu.com, search for Curtis Meyer) as a reference text for the derivations required by the first half of the course.

For Laboratory Work: electronic components, wires, wire cutters, oscilloscope, voltmeter, breadboard, function generator, and power supply.

For Analysis: calculators and spreadsheets.

Note from the Dean: "Success in this 4 credit hour course is based on the expectation that students will spend a minimum of 6 hours of study time per week in preparation for class (readings, papers, discussion sections, preparation for exams, etc.)."