Electronics Laboratory I, 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
Frequency Response and Step Response
Transformers and Power Supplies
Amplitude-Modulated Radio Reception
Combinatorial Logic
Registers and Counters

Capacitors, Inductors, and Impedance
Diodes and Rectification
Transistors and Audio Amplifiers
Operational Amplifiers
Oscillators and Clocks
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.)."