

IEEE's Hands on Practical Electronics (HOPE) Syllabus

Day/Time: Tuesday 5:00-6:30P

Location: 246 Cory Hall, Moore Room

Website: <http://ieee.eecs.berkeley.edu/hope/>

Contact: ieee.hope@gmail.com

Objective:

This course is designed to introduce the concepts of electrical engineering to a broad audience of people, specifically those who are not engineers or physicists. With that intent in mind, this course is designed to be taught minimally through lecture and allow maximum exposure to equipment and tools for hands on learning.

Lesson Format:

Lectures will be designed to explain thoroughly. Technical descriptions and analogies will both be used. Since we expect many of the students in the target audience to not have exposure to the level of math and physics necessary to fully understand the workings of the concepts we discuss, we will *not* be emphasizing it. The mathematical and physical descriptions will also be included for completeness.

Labs will usually consist of two parts. The first part will be a simple circuit that applies the concepts of the lesson followed by more challenging circuits for those who wish to attempt it. Labs do not need to be turned in. The corrected labs will be returned and the answers will be released the following week.

Course Specifics:

This course will span twelve weeks; the last two of which are reserved as build days for your projects where you build a final project that utilizes everything you'll learn this semester. The following is a tentative outline of the subjects we will cover during this course:

Week 0: Course Introduction

Week 1: Safety, Soldering, Terminology

Week 2: Voltage, Current, Resistance

Week 3: Ohm's Law, Equivalent Resistance

Week 4: Capacitance

Week 5: Silicon, Breadboards

Week 6: PN Junctions, Diodes, Solar Cells

Week 7: Transistors

Week 8: More Transistors, Intro to CMOS Technology, Digital Logic

Week 9: CMOS Technology, Digital Logic

Week 10: Final Project

Week 11: Final Project

Week 12: Overview of Modern Fabrication and Conclusion

Lessons, Labs and Handouts:

You can find all our lessons, labs and handouts at our website: ieee.eecs.berkeley.edu/hope. Currently, our slides from last semester are up. Although, we may be updating the materials after each week's lessons, we won't make too many changes. If you miss any classes, you can catch up by going through the lesson; to do the lab, you can stop by our lab, 246 Cory, on any weekday.

Grading:

Your grade is primarily based on attendance and your effort in class. Completion of the final project is also strongly recommended. Participation and completion of labs is strongly advised.

Attendance Policy:

You can miss one class unexcused. For any additional classes you miss (up to 2), you can make them up by attending an IEEE event. Any additional absences could result in a NP.

We may have make-up lab sessions; however you are always encouraged to come to our office, 246 Cory, during the week to complete any unfinished work, or try building circuits of your own.

Course Facilitators:

Priyanka Reddy, EECS '09
Andrew Ma, EECS '09
Alex Pai, EECS '09
Christine Lo, EECS '09

Linda Sha, CS '08
Victor Shia, EECS '10
Aaron Staley, EECS '08