

EE40 Course Description

Summer 2014

June 23rd – August 15th

Course Objectives: EE40 is one of the first electrical engineering classes that undergraduate students take. This course will teach students the fundamentals of electrical circuits – physical principles, design and analysis. It serves as a preparation for many of the more advanced courses in electrical engineering, however, it can also add breadth to the curriculum of non-electrical engineering students who will benefit from the insights gained into the fundamental working principles of electronic circuits ubiquitous in our modern world.

Topics covered:

- Introduction to electrical engineering and fundamentals: charge, current, voltage, Ohm's Law
- Resistive circuits: Kirchhoff (KVL, KCL), source transformations, Y-delta
- Circuit analysis: Nodal analysis, mesh analysis, superposition, equivalent circuits, Thevenin, Norton, bipolar junction transistor
- Amplifiers: General amplifiers, ideal op-amps
- Transient response: Capacitors, RC circuits, inductors
- Phasors
- Frequency response: Transfer functions, Bode plots, passive and active filters

Instructor: Gerd Grau (grau@eecs.berkeley.edu)

Course format:

- Lectures: 3 x 2 hours per week Monday, Wednesday, Friday. Online video lectures to allow more time in class for worked examples.
- Discussions: 2 hours per week
- Lab: 2 x 3 hours per week

Prerequisites: Mathematics 1B or equivalent

Textbook: Ulaby, F. T. and Maharbiz, M. M.: *Circuits* (2nd edition). NTS Press, 2013.

Final project: Circuit design project to be tested during the last week of the course

Midterms and Final tentative dates:

- Midterm 1: July 16th
- Midterm 2: July 30th
- Final: August 15th