

ENGR12L - Engineering Circuits Lab

Spring 2017

1 Unit (3 hours lab)

Co-requisite: Engineering Circuits

Description: An introduction to the construction and measurement of electrical circuits. Basic use of electrical test and measurement instruments including multimeters, oscilloscopes, power supplies, and function generators. Use of circuit simulation software. Interpretation of measured and simulated data based on principles of circuit analysis for DC, transient, and sinusoidal steady-state (AC) conditions. Elementary circuit design. Practical considerations such as component value tolerance and non-ideal aspects of laboratory instruments. Construction and measurement of basic operational amplifier circuits. Also offered online.

Learning Outcomes: By the end of the class, students should be able to

- Build electronics circuits and characterize circuit behavior using the appropriate instruments and techniques.

Objectives: By the end of the class, students should be able to

1. Access and use the most basic functions of electrical test and measurement equipment including oscilloscopes, multimeters, function generators and power supplies.
2. Read circuit schematics and construct linear circuits using resistors, capacitors, inductors, and/or op amps.
3. Measure resistance, DC and AC voltages, current, and power, and experimentally verify the results for a variety of electrical circuits.
4. Test circuits, analyze data and compare measured performance to theory and simulation.
5. Use a circuit simulation program (PSPICE, MultiSIM) and other computer applications (MATLAB, MS Excel) to predict or describe circuit behavior.
6. Troubleshoot and repair simple electric circuits.
7. Record and document results of lab work using text and graphs.
8. Work effectively in groups by sharing responsibilities and collaborating on findings.

Resource Links:

[Course Syllabus](#): lab content, course requirements, etc.

[Course Schedule](#): for the most recent offering of the class

[Course Documents](#): lab handouts, datasheets and other support material

Classroom and Tutorial Videos: from the latest semester – also linked from Schedule

[Lab Kit Materials List](#): components and vendors for the portable lab kit

[Lab Kit Packing List](#): included with kits