**EECE 2035: Circuits Laboratory 2**

**Class Schedule:** 1 - 50 minute lecture, 1 - 110 minute laboratory equivalent to 2 credits

**Course Coordinator:** Dr. James Richie

**Course Materials:**

**Supplies:** EECE Cable Kit, Took Kit, EECE 2035 Component Kit, EECE Aux Cable Kit

**Course Description:**

Circuit design, construction and test skills are expanded to include digital circuits and programmable logic devices as well as passive and active filters. Emphasis is placed on DC, AC and transient response of circuits containing passive and active devices.

**Prerequisites:** EECE 2010 and EECE 2015

**Corequisites:** EECE 2030 and ELEN 2020 or COEN 2020

**Required** in the Electrical Engineering and Computer Engineering programs and for the Bioelectronics major in the Biomedical Engineering program.

**Contribution to Professional Component:**

Engineering Science 70%

Engineering Design 30%

**Course Goals:**

* Reinforce student knowledge of electrical and electronic circuits with hands-on experiments.
* Reinforce student ability to construct circuits.
* Reinforce students knowledge of the basics of electronic test equipment measurement skills.
* Introduce students to the various circuit components, including rectifier diodes, signal diodes, zener diodes, LEDs and BJTs.
* Introduce students to the use of the circuit simulation program, PSpice (with Capture CIS and Probe).

**Course Objectives:**

*By the end of this course, you should be able to ....*

1. Use the circuit simulation program MultiSim
2. Use proper circuit construction techniques with an experimenter’s breadboard.
3. Use a DMM, power supplies, function generators and oscilloscopes as appropriate to the experiments.
4. Build and test various circuit networks.
5. Design various circuit networks, including (but not limited to) RLC networks, power factor correction networks, simple integrators and differentiators, simple passive filters as well as some simple digital # circuits.
6. Choose standard component values to allow circuits to function per desired specifications.
7. Use the World Wide Web to track down device data sheets.
8. Describe the physical construction of (simple) transformers.
9. Understand the basic physical construction of transformers.
10. Design and construct simple digital logic circuits and sequential logic circuits using discrete components.

**Contribution to Program Objectives:** partial fulfillment of Criterion 3 objectives A, B, C, G, H, I, J, and K

**Course Topics:**

note: laboratories 2 through 12 listed below may change each semester as new laboratories are developed or topics are reordered.

Lab 1: MultiSim Fundamentals - A Self-Paced Learning Experience

Lab 2: Transient Response Review

Lab 3: Lab Procedures Review and Steady State Response

Lab 4: Designing Reactive Circuits

Lab 5: Discrete Combinational Logic Circuits

Lab 6: Power Factor Correction

Lab 7: Transformers

Lab 8: Sequential Logic Circuits

Lab 9: Laplace Transforms-Integration and Differentiation

Lab 10: Passive Filters

Lab 11: Active Filters

Last modified: December 4, 2017