Course Syllabus
ECE 240L – Electrical Engineering Fundamentals Laboratory

Department: Electrical and Computer Engineering
Course Number: ECE 240L
Course Title: Electrical Engineering Fundamentals Laboratory
Credit Units: 1
Design Units: 0.25

Course Description
Laboratory course component of ECE 240. Introduction to practical aspects of electrical circuits, analysis and design. Lab includes experiments on resistive circuits, operational amplifiers, network theorems, 1st and 2nd order circuits, dc meters, passive filters, resonant circuits and RC active filters. Several experiments emphasize the design process. 3 hours lab per week.

Prerequisites by Topic
Students should have completed differential, integral, and solid analytic geometry, partial differentiation, and multiple integrals with applications (MATH150A, MATH150B, and MATH250). Also required is a completion of PHYS220B/L with coverage of electric and magnetic fields, circuit theory and electromagnetic induction. Students must be taking differential equations (Math 280 or ECE 280) with this course or must have completed it.

Text, References and Software
ECE 240 Laboratory Manual

PSPICE, by Cadence Corporation: http://www.cadence.com/

Software:
PSPICE, by Cadence Corporation (see Internet Resources below);

Internet Resources:
http://www.cadence.com/ (for downloading PSPICE)

Learning Outcomes for the Course – After completing this course the students should be able to:
1. Analyze and build resistor based circuits.
2. Analyze and build first and second order transient circuits.
3. Analyze, build, and characterize phasor circuits.
4. Analyze and build passive electric filter circuits.

Topics Covered/Course Outline
DC Resistor Circuits and Ohm’s Law
Thevenin and Norton Equivalent Circuits
Superposition
RC and RL Circuits
RLC Circuits
Phasors
Passive Electric Filters

Laboratory Reports

Contribution to Professional Component
Engineering Science: 0.75
Engineering Design 0.25

Relationship to Program Outcomes
This course supports the achievement of the following outcomes:

a. An ability to apply knowledge of math, science, and engineering to the analysis of electrical and computer engineering problems.
b. An ability to design and conduct scientific and engineering experiments, as well as to analyze and interpret data.
c. An ability to design systems which include hardware and/or software components within realistic constraints such as cost, manufacturability, safety and environmental concerns.
e. An ability to identify, formulate, and solve electrical and computer engineering problems.
g. An ability to communicate effectively through written reports and oral presentations.
i. A recognition of the need for and an ability to engage in life-long learning.
k. An ability to use modern engineering techniques for analysis and design.
m. An ability to analyze and design complex devices and/or systems containing hardware and/or software components.
n. Knowledge of math including differential equations, linear algebra, complex variables and discrete math.

Prepared by:
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