The University of Texas at Tyler
Department of Electrical Engineering

Course: EENG3304 – Linear Circuit Analysis I (Required)

Syllabus

Catalog Description:

Basic circuit elements (resistance; inductance, mutual inductance, capacitance, independent and controlled voltage and current sources). Topology of electrical networks; Kirchhoff 's laws; node and mesh analysis; dc analysis; introduction to operational amplifiers; complex numbers; sinusoidal steady-state ac circuit analysis; first and second-order circuits; transient analysis of first-order circuits.

Prerequisites: EENG 1301
Co-requisites: Math 3305, PHYS 2326 PHYS 2126,

Credits: (3 hours lecture, 0 hours laboratory per week)

Text(s): Fundamentals of Electric Circuits, Charles Alexander, 4th Edition, McGraw Hill. ISBN: 0077263197

Additional Material: Introduction to PSpice for Electric Circuits, James W. Nilsson, Pearson Education. ISBN: 0132448394

Course Coordinator: Hector Ochoa

Topics Covered: (paragraph of topics separated by semicolons)

In this course the student will cover DC and AC circuit analysis techniques; Kirchoff's Laws; Thevenin and Norton transformations; transformers; DEL to Y transformations; operational amplifiers; 1st order circuits and brief introduction to 2nd order circuits.

Evaluation Methods: (only items in dark print apply):

1. **Examinations / Quizzes**
2. **Homework**
3. Report
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

Course Objectives[1]: By the end of this course students will be able to:

1. Explain basic electrical concepts: electric potential, electric current, and electrical power[1,2]
2. Define concepts of electric network topology: nodes, branches, and loops[1,2]
3. Describe the characteristics of ideal voltage and current in resistors, capacitors, inductors and mutual inductors[1,2]
4. Describe the relationship of voltage and current in resistors, capacitors, inductors, and mutual inductors[1,2]
5. Apply Kirchhoff's voltage and current laws to the analysis of electric circuits[1]

6. Explain the concepts of Thévenin and Norton equivalent circuits and apply them to circuit analysis[1,2]
7. Analyze simple operational-amplifier circuits using an ideal op amp model[1,2]
8. Analyze simple transformer circuits [1,2]
9. Perform transient analysis of first-order circuits [1,2]
10. Apply the phasor transform to sinusoidal steady state analysis of electric circuits[1,2]
11. Characterize the response of 2nd order circuits[1,2]

[1] *Numbers in brackets refer to method(s) used to evaluate the course objective.*

Relationship to Program Outcomes (only items in dark print apply)[2]: This course supports the following Electrical Engineering Program Outcomes, which state that our students will:

1. **have the ability to apply knowledge of the fundamentals of mathematics, science, and engineering;**
2. **have the ability to use modern engineering tools and techniques in the practice of electrical engineering;**
3. **have the ability to analyze electrical circuits, devices, and systems;**
4. have the ability to design electrical circuits, devices, and systems to meet application requirements;
5. have the ability to design and conduct experiments, and analyze and interpret experimental results;
6. have the ability to identify, formulate, and solve problems in the practice of electrical engineering using appropriate theoretical and experimental methods;
7. have effective written, visual, and oral communication skills;
8. possess an educational background to understand the global context in which engineering is practiced, including:
   a. knowledge of contemporary issues related to science and engineering;
   b. the impact of engineering on society;
   c. the role of ethics in the practice of engineering;
9. have the ability to contribute effectively as members of multi-disciplinary engineering teams;
10. have a recognition of the need for and ability to pursue continued learning throughout their professional careers.

[2] *Numbers in brackets refer to course objective(s) that address the Program Outcome.*

Contribution to Meeting Professional Component: (in semester hours)

Mathematics and Basic Sciences:		hours
Engineering Sciences and Design:	3	hours
General Education Component:		hours

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Modified By:	Hector Ochoa		Jan 10, 2008
Modified By:	Hector Ochoa		Jan 11, 2009
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Modified By:	Ron Pieper		Nov 22, 2010
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