**The University of Texas at Tyler**
**Department of Electrical Engineering**

# EENG 3104 Linear Circuits Analysis I Laboratory (Required)

## Syllabus

Catalog Description:

Introduction to principles and operation of basic laboratory equipment; engineering report preparation; design and implementation of experiments based on DC and AC circuit theory, network theorems, time and frequency domain circuit analysis. One three-hour laboratory per week.

Prerequisites: Co-requisite: EENG 3304

Credits: (0 hours lecture, 1 hours laboratory per week )

Text(s): (Requiered)
1. NI myDAQ Student with NI LabVIEW, NI Multisim and NI Ultiboard (Part No. 781327-01 ), NI Protoboard for myDAQ (Part No. NIPCB1) (http://www.studica.com/us/en/NImyDAQ)

Additional Material:

Course Coordinator: Hector A. Ochoa

Topics Covered: (paragraph of topics separated by semicolons)

Electric concepts; Ohm's law; Kirchhoff's voltage and current laws; node and loop analysis; simple operational amplifier circuits; capacitance and inductance; sinusoidal response of *RC*, *RL*, and *RLC* networks.

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

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

Course Learning Outcomes (formerly Objectives)[1]: By the end of this course students will be able to:

1. Conduct basic laboratory experiments involving electrical circuits using laboratory test equipment such as multimeters, power supplies, signal generators, and oscilloscopes. [1]
2. Demonstrate the concept of Thevenin equivalent circuits in the laboratory. [3]
3. Demonstrate the concept of Linear superposition in the laboratory. [3]
4. Predict and measure the behavior of simple Operational-Amplifier Circuits. [3]
5. Design simple Operational-Amplifier Circuits. [1]
6. Predict and measure the transient and sinusoidal steady-state responses of RC, RL and RLC circuits. [3]
7. Prepare laboratory reports that clearly communicate experimental information in a

logical and scientific manner. [3]
8. Use modern engineering tools including modeling and simulation software and virtual instruments. [3]
9. Relate physical observations and measurements involving electrical circuits to theoretical principles. [3]
10. Evaluate the accuracy of physical measurements and the potential sources of error in the measurements. [3]
11. Use the concept of Thevenin and Norton equivalence to model unknown networks. [1]

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

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; [10]
2. have the ability to use modern engineering tools and techniques in the practice of electrical engineering; [1,8]
3. have the ability to analyze electrical circuits, devices, and systems; [2,3]
4. have the ability to design electrical circuits, devices, and systems to meet application requirements; [5]
5. have the ability to design and conduct experiments, and analyze and interpret experimental results; [4,6,9]
6. have the ability to identify, formulate, and solve problems in the practice of electrical engineering using appropriate theoretical and experimental methods; [11]
7. have effective written, visual, and oral communication skill; [7]
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 learning outcomes/objective(s) that address the Program Outcome.*

Contribution to Meeting Professional Component: (in semester hours)

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|---|---|---|
| Mathematics and Basic Sciences: | 0 | hours |
| Engineering Sciences and Design: | 1 | hours |
| General Education Component: | 0 | hours |

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| Prepared By: | Hector A. Ochoa | Date: | January 8, 2015 |
| Modified By: | | | |