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): (Required) None

Additional Material:

Course Coordinator: Premananda Indic

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. [6]
2. Demonstrate the concept of Thevenin equivalent circuits in the laboratory. [1]
3. Demonstrate the concept of Linear superposition in the laboratory. [1]
4. Predict and measure the behavior of simple Operational-Amplifier Circuits. [6]
5. Design simple Operational-Amplifier Circuits. [2]
6. Predict and measure the transient and sinusoidal steady-state responses of RC, RL and RLC circuits. [6]
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. [6]

9. Relate physical observations and measurements involving electrical circuits to theoretical principles. [6]
10. Evaluate the accuracy of physical measurements and the potential sources of error in the measurements. [1]
11. Use the concept of Thevenin and Norton equivalence to model unknown networks. [2]

[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. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics; [2,3,10]
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors; [5,11]
3. an ability to communicate effectively with a range of audiences; [7]
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts; [16]
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions; [1,4,6,8,9]
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
8.

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

Contribution to Meeting Professional Component: (in semester hours)

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

Prepared By:	Premananda Indic	Date:	27 May 2020
Modified By:			

EENG 3104: Linear Circuits Analysis Lab

Spring 2021 Syllabus

Instructor Information:

Premananda Indic, PhD
Department of Electrical Engineering,
The University of Texas at Tyler,
Office: RBN2010,
email:pindic@uttyler.edu (**preferred**)

Office Hours (by appointment via zoom only):

Tuesday	: 11:30PM to 1:00PM
Thursday	: 11:30PM to 1:00PM
Additional Hours	: By appointment

Course 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.

Topics Covered: 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.

The student course learning objectives are:

1. Conduct basic laboratory experiments involving electrical circuits using laboratory test equipment such as multimeters, power supplies, signal generators, and oscilloscopes.
2. Demonstrate the concept of Thevenin equivalent circuits in the laboratory.
3. Demonstrate the concept of Linear superposition in the laboratory.
4. Predict and measure the behavior of simple Operational-Amplifier Circuits.
5. Design simple Operational-Amplifier Circuits.
6. Predict and measure the transient and sinusoidal steady-state responses of RC, RL and RLC circuits.
7. Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner.
8. Use modern engineering tools including modeling and simulation software and virtual instruments.
9. Relate physical observations and measurements involving electrical circuits to theoretical principles.
10. Evaluate the accuracy of physical measurements and the potential sources of error in the measurements.
11. Use the concept of Thevenin and Norton equivalence to model unknown networks.

Evaluation and Grading:

The course grade will be based on the following activities:

1. **Lab Reports (60%):**

2. **Midterm Exam (20%):**
   Students are asked to design an experiment and write a procedure to perform the experiment

3. **Final Exam (20%):**
   Students will be given an experiment and will be asked to perform the experiment.

90% and above:	A
80% and above and less than 90%:	B
70% and above and less than 80%:	C
60% and above and less than 70%:	D
Below 60%:	F

Students are encouraged to read the academic honesty policy (Student Standards of Academic Conduct).