

ENGT 3050 Fundamentals of Electricity (4 semester credit hours)

Required

Current Catalog Description:

This course constitutes an introduction to basic analytical and laboratory techniques for resistive and reactive DC and AC electric circuits, and an introduction to electronic devices, including diodes and transistors. No credit towards a degree in Electrical Engineering Technology.

Textbooks:

1. "Foundations of Electronics Circuits and Devices," 4th Edition, Russell L. Meade, Thomson Delmar Learning, 2002.
2. Laboratory Manual.

References:

none

Related Program Outcomes (a, c, e, f and g):

Upon successful completion of the Computer Science and Engineering Technology program, graduates will have:

- an understanding of the analytical techniques used for basic DC and AC circuits, as evidenced by the ability to perform a circuit mesh analysis for a DC resistive circuit and an AC reactive circuit.
- an ability to conduct, analyze, and interpret experiments concerning basic DC and AC electrical circuits, as evidenced by the data and data analyses associated with laboratory notebooks and reports.
- an ability to function as part of a team, as evidenced by attendance and participation in the conduct of laboratory experiments with laboratory partners.
- an ability to identify, analyze and solve technical problems associated with basic electrical circuits, as evidenced by the ability to solve an assortment of electrical circuit problems on the final exam.
- an ability to communicate effectively, as evidenced by laboratory reports.

Course Objectives:

After successful completion of this course, students will be able to:

- develop an understanding of the analytical techniques used for basic DC and AC circuits.
- develop an understanding of the laboratory skills used to evaluate basic DC and AC circuits.
- analyze and interpret laboratory data from basic electric circuits.
- work effectively in the laboratory with lab partners.
- communicate the results of DC and AC circuit analyses in written reports.

Major Topics Covered in the Course

Topic	CC2001 Category	CC2001 Core	CC2001 Advanced
Basic electrical components and quantities.			
Definitions of voltage, current and electrical resistance.			
Ohm's Law, electrical energy and power.			
Series DC circuit analyses.			
Parallel DC circuit analyses.			
Series / parallel DC circuit analyses.			
Circuit theorems – superposition and Thevenin's theorem.			
Basic mesh current analysis techniques.			
Sinusoidal waves			
Inductors in DC circuits			
RL circuits with AC sources			
Transformers			
Capacitors in DC circuits			
RC circuits with AC sources			
RLC circuits with AC sources			
Semiconductors and diodes			
Introduction to transistors			
Totals			

Laboratory Projects:

- Resistor color codes.
- Ohm's Law.
- Power in DC resistive circuits.
- Resistors in series.
- Resistors in parallel.
- Mesh analysis and Thevenin's theorem.
- The oscilloscope and the function generator.
- RL circuits and time constants.
- RL circuits with AC sources.
- RC circuits and time constants.
- Frequency effects in series RLC circuits.
- The silicon diode and the diode curve.

CAC Categories

	CS Core	CS Adv
Data Structures		
Algorithms		
Software Design		
Computer Organization and Architecture		
Concepts of Programming Languages		

Oral and Written Communications

Laboratory reports.

Social and Ethical Issues

Not included

Theoretical Content

NA

Problem Analysis

NA

Solution Design

NA

Course Coordinator

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