

**1. Course Number and Name:**

ENGT 3050 Fundamentals of Electricity

**2. Credits and Contact hours:**

Credits: 4 hours, Contact: 2 lecture hours; 2 lab hours

**3. Instructor's or course coordinator's name:**

Gary L. Daugherty

**4. Text book, title, author, and year:**

Foundations of Electronics Circuits and Devices, 4<sup>th</sup> Edition, Russel L. Meade, 2002

**a. Other supplemental materials:**

Laboratory manual

**5. Specific Course Information:**

**a. Brief description of the content of the course (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.

**b. Pre-requisites, or co-requisites:**

None

**6. Specific goals for the course:**

**a. Specific outcomes of instruction:**

1. Develop an understanding of the analytical techniques used for basic DC and AC circuits.
2. Develop an understanding of the laboratory skills used to evaluate basic DC and AC circuits.
3. Analyze and interpret laboratory data from basic electric circuits.
4. Work effectively in the laboratory with lab partners.
5. Communicate the results of DC and AC circuit analyses in written reports.

**b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course:**

- A. 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.
- C. 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.
- E. An ability to function as part of a team, as evidenced by attendance and participation in the conduct of laboratory experiments with laboratory partners.
- F. 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.

G. An ability to communicate effectively, as evidenced by laboratory reports.

**7. Brief list of topics to be covered:**

1. Basic electrical components and quantities.
2. Definitions of voltage, current and electrical resistance.
3. Ohm's Law, electrical energy and power.
4. Series DC circuit analyses.
5. Parallel DC circuit analyses.
6. Series / parallel DC circuit analyses.
7. Circuit theorems – superposition and Thevenin's theorem.
8. Basic mesh current analysis techniques.
9. Sinusoidal waves
10. Inductors in DC circuits
11. RL circuits with AC sources
12. Transformers
13. Capacitors in DC circuits
14. RC circuits with AC sources
15. RLC circuits with AC sources
16. Semiconductors and diodes
17. Introduction to transistors