University of Arkansas - Fort Smith
5210 Grand Avenue
P. O. Box 3649
Fort Smith, AR 72913-3649
479-788-7000

General Syllabus

ELEC 1233 Fundamentals of Electricity

Credit Hours: 3 Lecture Hours: 2 Laboratory Hours: 2

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

An overall study of the fundamental principles of AC and DC, Ohm's law, and the power equation. Series, parallel, series-parallel circuits, and DC meters are introduced, and a study is made of the practical applications of mathematics related to electronics and electricity.

B. Additional Information - None

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Apply the first aid procedures for treatment of electric shock.
2. Exhibit knowledge of electrical hazards by following prescribed safety rules in the lab setting.
3. Demonstrate the correct use of a VOM for voltage, current, and resistance measurements with an accuracy of +/- 2%.
4. Examine peak-to-peak voltages and AC waveform periods within +/- 5%.
5. Examine resistor circuits for correct voltage, current, and power for each component with no less than 74% correct responses.
6. Design schematic diagrams and example circuits, identify without errors, circuits with components in series, parallel, or combination.
7. Assemble breadboard resistors in simple series, parallel, and combination circuits according to schematic diagrams from laboratory assignments.
8. Identify and explain voltages and currents in series, parallel, and combination circuits with at least 74% accuracy.
9. Apply a logical sequence for troubleshooting a voltage divider circuit.
10. Investigate problems in resistor circuits in series, parallel, and combination with an overall accuracy of at least 74%.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking - Students will investigate and implement troubleshooting measures on the three basic types of AC and DC circuits: series, parallel and series/parallel combination circuits. Students must learn the proper analytical troubleshooting techniques to determine faults in circuits in the laboratory.

Quantitative Reasoning -Students will solve various mathematic problems in the context of designing and implementing troubleshooting procedures on electrical circuits.

III. Major Course Topics

A. Electronic terms, metric prefixes and power of ten
B. Basic electrical quantities and calculator operations
C. Ohm's Law and power equation
D. Power and energy, resistor power ratings
E. Alternating voltage and current
F. Oscilloscope usage
G. Series circuits
H. Voltage dividers and troubleshooting
I. Parallel circuits
J. Parallel circuits troubleshooting
K. Series/parallel circuits
L. Series/parallel troubleshooting
M. Superposition, Thevenin’s theorem
N. Oscilloscope examination