ELC 112
DC/AC ELECTRICITY

COURSE DESCRIPTION:

Prerequisites: None
Corequisites: None

This course introduces the fundamental concepts of and computations related to DC/AC electricity. Emphasis is placed on DC/AC circuits, components, operation of test equipment; and other related topics. Upon completion, students should be able to construct, verify, troubleshoot, and repair DC/AC circuits. Course Hours Per Week: Class, 3. Lab, 6. Semester Hours Credit, 5.

LEARNING OUTCOMES:

A student that successfully completes this course will be able to:

a. Explain, discuss and describe the principles and theories related to basic series, parallel and series-parallel dc and ac circuit analysis.
b. Synthesize, analyze and solve DC and AC circuit network problems.
c. Use volt, ohm and amp meters.

OUTLINE OF INSTRUCTION:

I. Introduction to electricity
   A. Scientific notation
   B. Engineering (metric) notation

II. Voltage, current, and power
   A. Atomic theory
   B. Electric charge
   C. Electron theory
   D. Voltage and current
   E. Ohm's law
   F. Power
   G. Voltage and current measurements

III. Voltage sources
   A. Cells
   B. Batteries
      1.) Primary
      2.) Secondary
      3.) Wet

4.) Dry
C. Other sources of voltage

IV. Resistance
A. Resistivity of materials
B. Temperature relation
C. Types
D. Color code

V. Series circuits
A. Voltage drops
B. Circuit current
C. Circuit power
D. Voltage divider
E. Ground reference

VI. Parallel and series-parallel circuits
A. Voltage drops
B. Circuit current
C. Circuit power
D. Current divider

VII. Capacitance
A. Properties of capacitors
B. Types
C. Time constants
D. Capacitors in series
E. Capacitors in parallel

VIII. Magnetism
A. Magnetic field
B. Types of magnetic sources
C. Electromagnetism

IX. Inductance
A. Properties of inductors
B. Types
C. Time constants
D. Inductors in series
E. Inductors in parallel

X. Alternating current and voltage
A. Electromagnetic induction
B. The sine wave

C. Frequency
D. Amplitude
E. Transformers

XI. Alternating current circuits
A. Reactive components
1.) Inductive reactance
2.) Capacitive reactance
B. Impedance
C. Resonance
D. Power
1.) Apparent
2.) Real
3.) Reactive

REQUIRED TEXTBOOKS AND MATERIAL:

Herman, Stephen L. Delmar's Standard Textbook of Electricity. Delmar Publishers Inc., 3rd ed. 2004.

STATEMENT FOR STUDENTS WITH DISABILITIES:

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 686-3652 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1309.