PHY 262
Electrical Circuits and Devices

Course Description

This course covers basic AC, DC, and digital circuits and their applications in instrumentation. (same as EGR 215.)

Course Corequisite

Electrical Circuits and Devices Laboratory (PHY 262L)

Course Prerequisites

- Electricity, Sound, and Light (PHY 132) or Technical Physics II (PHY 242)
- Calculus I (MTH 233)

Specific Course Requirements

Textbook Requirements

See current semester textbook list at http://www.physics.sfasu.edu/docs/books.pdf

Course Objectives

This course will stress the theory and function of basic circuit components such as resistors, capacitors, inductors, diodes, and transistors.

Student Learning Outcomes

By the end of the course, a successful student will be able to:

- Demonstrate a clear understanding of the theory and function of basic circuit components such as resistors, capacitors, inductors, diodes, transistors, transformers, and semiconductor devices.
- Design and construct DC transient and AC filter circuits.
- Build digital logic circuits using integrated circuit gates and interpret their operation.

Course Content:

- Resistive Circuits
- Inductance and Capacitance
- Transients
- Steady-State Sinusoidal Analysis
- Frequency Response and Resonance
- Logic Circuits
- Microcomputers
- Computer-Based Instrumentation
- Diodes
- Amplifiers
- Field Effect Transistors
- Bipolar Junction Transistors
- Operational Amplifiers
- Transformers
- DC Machines
- AC Machines

Course Assessment

The course assessment may use any or all of the following evaluation tools: exam scores, classroom participation, homework average, quizzes, and team projects. The lecture and laboratory grades are combined and the same grade will be recorded for both lecture and laboratory.