

University of Arkansas - Fort Smith
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General Syllabus

ELEG 21143 Electric Circuits II

Credit Hours: 3

Lecture Hours: 3

Laboratory Hours: 0

Prerequisite: ELEG 21043 Electric Circuits I

Pre- or Corequisite: ELEG 21131 Electric Circuits II Lab

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

Introduction to complex numbers. Sinusoidal steady-state analysis of electric circuits, active, reactive, apparent, and complex power; balanced and unbalanced three-phase circuits, mutual inductance; the use of the Laplace Transform for electric circuit analysis and two-port networks.

B. Additional Information

This course is a requirement for all electrical engineering majors. No substitutions or transfers will be allowed.

II. Student Learning Outcomes

A. Subject Matter

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

1. Use complex numbers to solve AC circuit problems.
2. Understand phasors and their relations to solving and analyzing AC circuits.
3. Explain and demonstrate how to calculate steady-state three phase power.
4. Explain and demonstrate how to analyze and solve three-phase power distribution system problems.
5. Explain and demonstrate how to apply Laplace transforms to general transient and steady-state circuit analysis.
6. Understand frequency selective circuits and how to generate and apply them to various systems.
7. Understand two-port networks and their applications to complex systems.
8. Demonstrate the ability to use computers to analyze and solve circuit problems.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking Skills - Students will identify a problem and apply circuit theory techniques to develop a solution.

Quantitative Reasoning - Students will use calculus and differential equation skills along with circuit theory techniques by applying relevant information in solving complex steady state and transient circuit problems.

III. Major Course Topics

- A. Complex Numbers
- B. Sinusoidal Steady State Analysis
- C. Sinusoidal Steady-State Power Calculation
- D. Three Phase Circuits
- E. The Laplace Transform in Circuit Analysis
- F. Frequency Selective Circuits
- G. Two Port Circuits