

University of Arkansas - Fort Smith
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General Syllabus

ELTE 27303 Advanced Electronic Circuits

Credit Hours: 3

Lecture Hours:

Lab Hours: 2

2 Prerequisite: ELTE 13903 Solid State

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

Covers advanced electronic circuit analysis and trouble-shooting, and positive and negative feedback circuits.

B. Additional Information

This course greatly extends the student's knowledge of active circuits using transistors or integrated circuit amplifiers. Most circuits in this class use positive or negative feedback such as sinusoidal and relaxation oscillators, linear and nonlinear feedback amplifiers, phase-lock loops, voltage regulators and active filters.

II. Student Learning Outcomes

A. Subject Matter

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

1. Construct and successfully operate various tuned circuits and oscillators using a circuit breadboard and the facilities of the electronics laboratory.
2. Construct and successfully operate feedback circuits with operational amplifiers using a circuit breadboard and the facilities of the electronics laboratory.
3. Describe, with all essential details, the frequency effects of tuned circuits in accordance with lecture notes and textbook readings.
4. Describe, with all essential details, the operation of circuits with either positive or negative feedback in accordance with lecture notes and textbook readings.
5. Describe, with all essential details, circuits using operational amplifiers as oscillators, filters and amplifiers according to lecture notes and textbook

readings.

6. Use the computer software to simulate various electronic circuits in the computer laboratory with at least 74% accuracy.
7. Using the facilities and resources of the electronics laboratory, identify problems in audio and RF sinusoidal oscillators with at least 74% accuracy.
8. Using the facilities and resources of the electronics laboratory, locate faults in circuits employing operational amplifiers with no less than 74% correct responses.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking - Student will analyze and troubleshoot faults in audio, in RF sinusoidal oscillators and operational amplifiers.

Quantitative Reasoning - Students must be able to utilize mathematics to solve various electrical problems.

III. Major Course Topics

- A. Frequency Effects and amplifier response
- B. Class C and RF Tuned Ampl., Neutralization
- C. Frequency Multipliers
- D. JFETS
- E. MOSFETS
- F. Decibels
- G. Hearing, Audio Controls, Noise Distortion
- H. Audio and RF Sinusoidal Oscillators
- I. Crystal Oscillators, Relaxation Oscillators
- J. Phase Locked Loops
- K. Op-Amp Theory, Negative Feedback
- L. Op-Amp Frequency Response and Applications
- M. Op-Amp Applications and Active Filters
- N. Voltage Regulated Power Supplies