



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Electrical Circuits and Electronic Devices Laboratory

ECE 2307

Credit Hours:

0.50 - 0.50

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Lab

Course Description:

Introduction to circuit analysis; circuit analysis concepts and mechanical systems analogies; applications of electronic devices; operational amplifiers; electrical instruments and measurements. Lab only.

Prerequisites and Co-requisites:

Prereq or concur: 2301.

Course Goals / Objectives:

- Master the basic laws of circuit theory
 - Be competent to analyze simple resistive or dc circuits
 - Be competent in the analysis of steady-state RC and RL circuits, including frequency domain concepts and filters
 - Be competent in the transient analysis of RC and RL circuits
 - Be familiar with the fundamentals of AC power circuits, including the distinction between three-phase and residential power wiring and distribution
 - Be competent in the analysis of basic ideal and non-ideal operational amplifier circuits
 - Be familiar with diodes and their application in rectifiers
 - Be familiar with the basics of electronic instrumentation and measurements
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Course Topics:

- Fundamentals of electric circuits: Kirchhoff's current & voltage laws, power & sign conventions, Ohm's law, practical sources & measuring devices
 - Resistive network analysis: node voltage analysis, mesh current analysis, superposition & Thevenin equivalent, loading
 - AC network analysis: capacitors and inductors, sinusoids and sinusoidal response; phasor analysis of sinusoidal circuits
 - Transient analysis with emphasis on 1st order circuits and brief overview of 2nd order circuits
 - Sinusoidal frequency response of RLC circuits, filter circuits
 - Ideal op-amps, basic op-amp circuits
 - Diodes: ideal diode model and constant-voltage-drop circuit models, applications in rectifiers and for snubbers
 - Bipolar junction transistors: operations, circuit models and applications
 - Field-effect transistors: operations, circuit models and applications
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Designation:

Elective