



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Electrical Circuits for Engineering Technology

ENGRTEC 2300

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Lecture

Lab

Course Description:

Fundamentals of electrical circuits, measuring & analyzing data, & troubleshooting those circuits. Analysis of Direct Current (primarily) & Alternating Current circuits (less content) & effects of different components- resistors, capacitors, inductors, and other components in electrical circuits. DC/AC circuit dynamics that will be used in studies of industrial & electronic control applications.

Prerequisites and Co-requisites:

Prereq: Math 1155 or 1172, and Physics 1231 or 1251.

Course Goals / Objectives:

- Ability to apply knowledge of electrical circuits to build, analyze, and troubleshoot electrical circuits.
 - Describe the fundamentals of electrical concepts in DC and AC systems and design electrical circuits
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 - Familiarity with knowledge of using laboratory instruments and measurement tools to analyze and interpret results
 - Ability to perform effective methodologies using critical troubleshooting skills
 - Ability to function individually and on teams and communicate effectively
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Course Topics:

- Introduction to circuits (voltage, current, and resistance (ohms law))
 - Introduction to troubleshooting of electrical circuits and safety
 - Power in electric circuits/ Kirchhoff's Laws (Series and Parallel Circuits)
 - Ladder Networks / Voltage and current sources
 - Superposition/Equivalent circuits (Norton & Thevenin theorems)
 - Branch/Loop, and Nodal Analysis
 - Magnetism and electromagnetism
 - AC circuits/Phasor Analysis
 - Capacitors/inductors
 - RLC circuits and Resonance
 - Passive filters/Bod plot
 - Diodes (AC/DC Conversion) and Transistors
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Designation:

Required