

J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: EGR 271 **Credits:** 4

Course Title: Electric Circuits 1

Course Description:

Covers fundamentals of electric circuits. Teaches resistive circuit analysis methods, including network theorems. Teaches operational amplifiers, capacitors, inductors, resistor-capacitor (RC), resistor-inductor (RL) and resistance-inductance-capacitance (RLC) circuit transient response. Introduces phasor representation of alternating current (AC) circuits. Utilizes circuit design processes, technical writing and computer software for problem solving. Includes laboratory analysis to explore course concepts. Prerequisite: MTH 264 and EGR 121. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week. 4 credits

General Course Purpose:

EGR 271 provides fundamental skills in circuit analysis and design for resistive, RC, RL, RLC and op amp circuits.

Resistive circuit analysis

Analyze resistive circuits by combining series and parallel resistance

Analyze operational amplifier circuits
Include applications of op amp circuits

RC, RL, and RLC Circuits

Define basic properties of capacitors and inductors.
Define and calculate voltage, current, power and energy for capacitors and inductors.
Analyze RC and RL circuits with constant forcing functions
Analyze RLC circuits with constant forcing functions

Phasors

Perform calculations using complex numbers (math)
Introduce the use of phasors to represent sinusoidal steady state signals, and circuit elements

Lab Equipment Usage

Use a power supply and function generator as sources for circuit
Use a multimeter and oscilloscope to measure DC and AC quantities

Lab Work

Design and build circuits to explore course topics
Design and build circuits based on specified criteria
Utilize simulation, programming environments, and lab equipment to analyze circuits and designs
Write clear, cogent, succinct technical reports