DeAnza College

Instructor: Taylor Kidd

Email: prof743kid@gmail.com
Office Hours: MTWR 9:00-9:30 AM and MW 6:00-6:30 PM in S48

ENGR 37 **Introduction to Circuit Analysis** **5 Unit(s)**

Prerequisite: MATH 1D; PHYS 4B (may be taken concurrently).

Five hours lecture (60 hours total per quarter).

Introduction to the analysis of lumped, linear, bilateral circuits. Basic equations, elementary network differential equations; natural and forced response of simple circuits. Development of steady state sinusoidal circuit analysis for the network differential equations.

Student Learning Outcome Statements (SLO)

The student will be able to analyze circuits containing resistive, capacitive, inductive passive elements, along with op-amps interconnected to voltage and current sources. The student will be able to use circuit laws and network theorems to solve DC steady state circuits, RC, RL, and RLC DC circuit transients and sinusoidal AC steady state circuits.

II. Course Objectives

A. Identify basic concept and circuit elements.
B. Analyze resistive circuits
C. Apply nodal and loop Analysis
D. Calculate capacitance and inductance
E. Analyze first and second order transient circuits
F. Examine AC steady-state analysis: current and voltage across elements

III. Essential Student Materials

Scientific calculator (TI 89 recommended)

IV. Essential College Facilities

None

V. Expanded Description: Content and Form

A. Identify basic concept and circuit elements.
1. System units
2. Basic quantities
3. Circuit elements
a. Resistor
b. Inductor
c. Capacitor
d. Dependent sources
e. Independent sources
4. Terminal characteristics
a. Current
b. Voltage
B. Analyze resistive circuits
1. Ohm's law
2. Kirchhoff' law
3. Single-loop circuits
4. Single-node-pair circuits
5. Series and parallel resistor combinations
6. Wye to delta transformations
7. Circuits With Dependent Sources
C. Apply nodal and loop Analysis
1. Nodal Analysis
2. Loop Analysis
3. Solve circuits involving operational amplifiers
4. Superposition
5. Thevenin's and Norton's theorems
6. Maximum power transfer
D. Calculate capacitance and inductance
1. Capacitors
2. Inductors
3. Capacitor and inductor combinations
4. RC operational amplifier circuit
E. Analyze first and second order transient circuits
1. First-order circuits
2. Second-order circuits transient analysis
3. Steady-state analysis
F. Examine AC steady-state analysis: current and voltage across elements
1. Phasors
2. Sinusoids
3. Sinusoidal and complex forcing functions

VI. Assignments

A. Required reading in the textbook
B. Solution of assigned problems

VII. Methods of Instruction

Lecture and visual aids
Discussion of assigned reading
Quiz and examination review performed in class
Homework
Discussion and problem solving performed in class

VIII. Methods of Evaluating Objectives

A. Midterm exams that appraise comprehension and require synthesis and application of course material.
B. Comprehensive final examination which shows the students ability to integrate and analyze the concepts developed throughout the course.
C. Grading quizzes and/or assigned problems and grading computer assignments that evaluate comprehension and application of class concepts.

IX. Texts and Supporting References

A. Examples of Primary Texts and References
1. Fundamentals of Electric Circuits, Charles Alexander, Matthew Sadiku. MacGrawHill 5th Ed. 2013
B. Examples of Supporting Texts and References
1. None