

Introduction to Circuit Analysis (ENGR D037 – Section 20Z)

De Anza College Winter 2022

Ali Saeidi Ashtiyani

Lectures:

Mondays – Wednesdays – Thursdays 1:30 PM-2:20 PM

Join Zoom Meeting

<https://fhda-edu.zoom.us/j/97978103405?pwd=OUJUN3pua0I2MEFwc2hEOTdsNUM5UT09>

Meeting ID: 979 7810 3405

Passcode: 388588

Office hours:

Office Hour: Tuesdays 5:30 to 6:30pm (BY APPOINTMENT)

<https://fhda-edu.zoom.us/j/95909058655?pwd=YUNnTUF3aWpWYk1FT2p4ZHIwNmhNZz09> (Links to an external site.)

Meeting ID: 959 0905 8655

Passcode: 137866

Email: saeidashtiyaliani@fhda.edu

Course objectives

Emphasizes practical electronics applications and products. DC and AC theory; Ohm's Law, Kerchoff's Laws, Power Laws network theorems, schematic diagrams, instrumentation and measurement, and functions of discrete components.

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

- Develop an understanding and working knowledge of the fundamentals of DC and AC theory and theorems.
- Define current, voltage, and Kirchhoff's current and voltage laws.
- Use voltage and current to calculate power dissipated by devices in a circuit.
- Use Ohm's law to determine voltage and current relationship in linear devices.
- Analyze series, parallel, series-parallel, and network circuits
- Apply the principle of superposition, Thevenin's equivalent circuits, and Norton's equivalent circuits.
- Analyze circuits containing independent current and voltage sources.
- Describe the properties of inductors, capacitors and obtain transient responses of circuits containing these elements.
- Identify the amplitude, frequency, and phase of a sinusoidal function.
- Transform sinusoidal current and voltage signals from time domain to frequency domain.
- Use the phasor concept to obtain solution of first and second order transient and steady state circuits.
- Use laboratory tools such as oscilloscopes, multimeters, function generators, and power supplies.
- Assemble a circuit and perform voltage and current measurements.
- Perform a critical evaluation of the differences between analytical solutions and the experimental measurements.

Required Text Books

- Principles of Electric Circuits: Conventional Current Version, 8 OR 9 OR 10th Edition, Thomas L Floyd, ISBN-13: 9780137408993
- Experiments in Basic Circuits: Theory and Application, 8 OR 9 OR 10th Edition, David M. Buchla, Yuba Community College, David M. Buchla, Yuba Community College

Course Evaluation

The total points earned on all the midterms, quizzes, assignments, lab project, research paper, and final exam will be divided by the total possible points and the resulting percentage will determine the course grade.

Midterm: 20%

Homework Assignments 20%

Lab Assignments 20%

Activities 5%

Final exam 35%

And the overall course grade (letter-grade) will be assigned based on the distribution below:

- 100% to 94.5%: A
- 94.5% to 89.5%: A-
- 89.5% to 86.5%: B+
- 86.5% to 83.5%: B
- 83.5% to 79.5%: B-
- 79.5% to 74.5%: C+
- 74.5% to 69.5%: C
- 69.5% to 66.5%: D+
- 66.5% to 63.5%: D
- 63.5% to 59.5%: D-
- <59.5%: F

Important Notes:

- Lab and homework assignments must be submitted by the given due date. Late submissions may be subject to 50% grade deduction.

- Most weeks, a single lecture will be given to students to complete lab assignments.

Please note that the instructor will create a master project folder on Dropbox during the first week of class to create access for each team. Students are required to contentiously upload their work to this folder. Students are responsible for checking the calendar folder on a regular basis to see if there is a change in the schedule.

Americans with Disabilities Act:

If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with DRC to establish a record of their disability.

Course Outline

<u>Week</u>	<u>Lecture</u>	<u>Topics</u>
1	Chapter 1	Quantities and Units
2	Chapter 2	Voltage, Current, and Resistance
	Chapter 3	Ohm's law
3	Chapter 4	Energy and Power
		Lab1
4	Chapter 5	Series Circuits
		Lab2
5	Chapter 6	Parallel Circuits
		Lab3
6		Midterm
7	Chapter 7	Series-Parallel Circuits
		Lab4
8	Chapter 8	Theorems and Conversions

		Lab5
9	Chapter 10	Magnetism and Electromagnetism Lab6
10	Chapter 12	Capacitors Lab7
11	Chapter 13	Inductors
Final	Thursday	1 PM to 3 PM

Student Learning Outcome(s):

*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.