

## **Introduction to Circuit Analysis (ENGR D037.42Z)**

**Ali Saeidi Ashtiyani**

### **Lectures:**

Tuesday - Thursday 6:30 PM - 7:45 PM

### **Join Zoom Meeting**

<https://fhda-edu.zoom.us/j/91491434285?pwd=aFFzUi9uUnpKUmVucUJoc0c5WExPdZ09>

Meeting ID: 914 9143 4285

Passcode: 595822

### **Google Classroom:**

<https://classroom.google.com/c/NDg0MzI3ODUxMjQz?cjc=w4jdpvo>

### **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: [saeidiashtiyaliani@fhda.edu](mailto:saeidiashtiyaliani@fhda.edu)

## **Course objectives**

Emphasizes practical electronics applications and products. DC theories; 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 Kirchoff'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.

Homework Assignments 15%

Quizzes 5%

Activities 5%

Lab Assignments 20%

Midterm: 20%

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, we will have a single lecture to explain and highlight important concepts**

## **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

<b>Week</b>	<b>Lecture</b>	<b>Topics</b>
<b>1</b>	<b>Chapter 1</b>	<b>Quantities and Units</b>
<b>2</b>	<b>Chapter 2</b>	<b>Voltage, Current, and Resistance</b>
<b>3</b>	<b>Chapter 3</b>	<b>Ohm's law</b>
<b>4</b>	<b>Chapter 4</b>	<b>Energy and Power</b>
<b>5</b>	<b>Chapter 5</b>	<b>Lab1</b>
<b>6</b>	<b>Chapter 6</b>	<b>Series Circuits</b>
<b>7</b>	<b>Chapter 7</b>	<b>Lab2</b>
<b>8</b>	<b>Chapter 8</b>	<b>Parallel Circuits</b>
<b>9</b>	<b>Chapter 9</b>	<b>Lab3</b>
<b>10</b>	<b>Chapter 12</b>	<b>Midterm</b>
<b>11</b>	<b>Chapter 13</b>	<b>Series-Parallel Circuits</b>
<b>Final</b>	<b>Thursday</b>	<b>Lab4</b>
		<b>Theorems and Conversions</b>
		<b>Lab5</b>
		<b>Branch, Loop, and Node</b>
		<b>Lab6</b>
		<b>Capacitors</b>
		<b>Inductors</b>
		<b>6:15 PM to 8:15 PM</b>



**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.

**Office Hours:**

TH      05:30 PM      06:30 PM      Zoom