IMPERIAL VALLEY COLLEGE

Basic Course Information

Semester:	**Sprint 2023**	Instructor Name:	**Octavio Ortiz**
Course Title & #:	**ENGR 240**	Email:	**octavio.ortiz@imperial.edu**
CRN #:	**21045**	Webpage (optional):	**Canvas**
Classroom:	**3112**	Office #:	**2767.1**
Class Dates:	**2/13 – 6/9**	Office Hours:	**Faculty Schedule**
Class Days:	**T/TR**	Office Phone #:	**760-355-5706**
Class Times:	**8:00 – 9:25 PM**	Emergency Contact:	**Silvia Murray**
Units:	**3**	Class Format:	**Face-to-Face (On Ground)**

Course Description

Circuit analysis by reduction methods, source transformations, mesh and nodal analysis. Operational amplifier model, transient analysis, alternating current circuits, impedance, power, phasor diagrams, and three-phase balanced networks. (CSU/UC)

Course Prerequisite(s) and/or Corequisite(s)

MATH 194 and PHYS 202

Student Learning Outcomes

Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to:

1. Solve problems involving resistive circuits.
2. Solve problems involving circuit theorems of Thevenin and Norton.
3. Understand the complete response of RL and RC circuits.

Course Objectives

Upon satisfactory completion of the course, students will be able to:

1. Solve problems involving electric circuit variables.
2. Solve problems involving circuit elements.
3. Solve problems involving series and parallel resistors.
4. Solve problems involving methods of analysis of resistive circuits.
5. Solve problems involving application of circuit theorems.
6. Solve problems involving the operational amplifier.
7. Solve problems involving energy storage elements.
8. Solve problems involving the complete response of RL and RC circuits.
9. Solve problems involving sinusoidal steady-state analysis.
10. Solve problems involving AC steady-state power.

IMPERIAL VALLEY COLLEGE

Textbooks & Other Resources or Links

Fundamentals of Electric Circuits
Author: Charles Alexander, Matthew Sadiku
Edition: 7th
ISBN: 978-1-260-22640-9
Copyright Year: 2021
Publisher: McGraw Hill

Course Requirements and Instructional Methods

Students will be exposed to various instructional methods. In person lectures will introduce students to fundamental electrical engineering concepts. Students will then apply what they learn in lectures to problems selected from the textbook.

Homework assignments will consist of an adequate number of applied problems selected from the textbook. Solving the homework problems will help students develop the problem solving and critical thinking skills that they will need for the chapter tests and the final exam.

The chapter tests will be focused on the content covered in a particular chapter(s). Questions will consist of multiple choice, true/false and short answer to assess conceptual and theoretical understanding. In addition, a few problems will be similar the ones on the lecture notes and the homework assignments. The final exam will be comprehensive.

Course Grading Based on Course Objectives

ASSIGNMENT	POINTS
Homework Assignments	**10%**
Approximately 10-12 homework assignments	
Tests	**60%**
Four chapter tests (15% each)	
Final Exam	**30%**
Comprehensive final exam **6/8/23**	
Total	**100%**

Score	Letter Grade
≥ 90%	**A**
≥ 80%	**B**
≥ 70%	**C**
≥ 60%	**D**
< 60%	**F**

IMPERIAL VALLEY COLLEGE

Course Policies

Attendance:

Students are expected to attend every class meeting. Lectures will preview homework assignments.

- Although attendance is not explicitly factored into your grade, failing to complete homework assignments and assessments due to absences will negatively impact your grade.
- Students with excessive absences will be dropped from the course as outlined in AP 5075.

Late Submissions:

Homework assignments are to be completed and submitted by the due date stated on Canvas. Late homework assignments will be accepted and penalized as follows:

- 70% maximum score if submitted within 24 hours of due date
- 50% maximum score if submitted 24 hours past the due date

Make-up Assignments:

There are no make-up assignments.

- Homework assignments that are more than a week past due will receive a score of 0 and cannot be made up.
- Tests and final exam cannot be made up, however, if the material is presented again in future assessments, then the failed assessment will be reevaluated.

Drop Policy

The instructor reserves the right to drop students who fail to attend the first-class session or fail to complete the first assignment by the assigned due date.

IVC Student Resources

IVC wants you to be successful in all aspects of your education. For help, resources, services, and an explanation of policies, visit http://www.imperial.edu/studentresources or click the heart icon in Canvas.

Course Calendar

The semester calendar is meant to provide an overview of the topics that will be covered throughout the semester. Every effort will be made to adhere to the calendar; however, changes might be necessary.

Week	Date	Topic	Assignment
Week 1	2/14	• **Syllabus** • Chapter 1 – Basic Concepts ○ Charge and Current ○ Voltage ○ Power & Energy	
	2/16	• Chapter 1 – Basic Concepts ○ Circuit Elements ○ Applications	
Week 2	2/21	• Chapter 2 – Basic Laws ○ Ohm's Law ○ Nodes, Branches, and Loops ○ Kirchhoff's Laws	
	2/23	• Chapter 2 – Basic Laws ○ Series Resistors & Voltage Division ○ Parallel Circuits & Current Division	
Week 3	2/28	• Chapter 2 – Basic Laws ○ Wye-Delta Transformations ○ Applications	
	3/2	• **Test: Chapters 1-2**	
Week 4	3/7	• Chapter 3 – Methods of Analysis ○ Nodal Analysis ○ Nodal Analysis and Voltage Sources	
	3/9	• Chapter 3 – Methods of Analysis ○ Mesh Analysis ○ Mesh Analysis with Current Sources	
Week 5	3/14	• Chapter 3 – Methods of Analysis ○ Nodal and Mesh Analyses by Inspection ○ Nodal Versus Mesh Analysis	
	3/16	• Chapter 3 – Methods of Analysis ○ Circuit Analysis with PSpice ○ Applications	
Week 6	3/21	• **Review Chapters 3**	
	3/23	• **Test: Chapter 3**	
Week 7	3/28	• Chapter 4: Circuit Theorems ○ Linearity Property ○ Superposition ○ Source Transformation	

Week	Date	Topic	Assignment
	3/30	• Chapter 4: Circuit Theorems ○ Thevenin's Theorem ○ Norton's Theorem ○ Maximum Power Transfer ○ Applications	
Week 8	4/4	• Chapter 6 – Capacitors and Inductors ○ Capacitors ○ Series and Parallel Capacitors	
	4/6	• Chapter 6 – Capacitors and Inductors ○ Inductors ○ Series and Parallel Inductors ○ Applications	
Week 9	4/18	• **Review Chapters 4 & 6**	
	4/20	• **Test: Chapters 4 & 6**	
Week 10	4/25	• Chapter 7 – First-Order Circuits ○ The Source-Free ○ The Source-Free RL Circuit	
	4/27	• Chapter 7 – First-Order Circuits ○ Singularity Functions ○ Step Response of an RC Circuit ○ Step Response of an RL Circuit	
Week 11	5/2	• Chapter 9 – Sinusoids and Phasors ○ Sinusoids ○ Phasors	
	5/4	• Chapter 9 – Sinusoids and Phasors ○ Phasor Relationships for Circuit Elements ○ Impedance & Admittance ○ Kirchhoff's Law and Frequency Domain	
Week 12	5/9	• **Review Chapters 7 - 9**	
	5/11	• **Test: Chapters 7 & 9**	
Week 13	5/16	• Chapter 10 – Sinusoidal Steady-State Analysis ○ Nodal Analysis ○ Mesh Analysis	
	5/18	• Chapter 10 – Sinusoidal Steady-State Analysis ○ Superposition Theorem ○ Source Transformation ○ Thevenin and Norton Equivalent Circuits	
Week 14	5/23	• Chapter 5 – Operational Amplifiers ○ Operational Amplifiers ○ Ideal Op Amp	
	5/25	• Chapter 5 – Operational Amplifiers ○ Inverting Amplifier ○ Noninverting Amplifier ○ Summing Amplifier	

Week	Date	Topic	Assignment
Week 15	5/30	• Chapter 5 – Operational Amplifiers ○ Difference Amplifier ○ Cascaded Op Amp Circuits	
	6/1	• Chapter 5 – Operational Amplifiers ○ Applications	
Week 16	6/6	• Review Chapters 1-7, 9, 10	
	6/8	• **Comprehensive Final Exam**	

*****Subject to change without prior notice*****