

The University of Jordan
School of Engineering
Electrical Engineering Department
Summer Semester – A.Y. 2022/2023



Course:	Electrical Engineering – 0903203 (3 Cr. – Required Course)
Instructor:	Prof. Eyad A. Feilat, Prof. Mohammed Khasawneh, Dr. Nabeel Tawalbeh, Dr. Hasan Farahneh Office: E001, Telephone: 06/5355000 ext 22860, Email: e.feilat@ju.edu.jo Office Hours: Will be posted soon
Course website:	2UJ2024 ELECTRICAL ENGINEERING Section 5 General Microsoft Teams
Catalog description:	Ohm's and Kirchhoff's Laws. Series and parallel connections. Voltage and current division. Nodal and mesh analysis. Thevenin theorem. Inductance and capacitance. Characteristics of a sinusoid. The phasor concept. Phasor relationships for R, L, and C elements. Impedance and admittance. Effective values of current and voltage. Instantaneous, average and apparent power and power factor. Three-phase wye and delta connections.
Prerequisites by course:	Py 0302102 General Physics II (pre-requisite)
Prerequisites by topic:	Students are assumed to have a background in the following topics: <ul style="list-style-type: none">• Magnetic and electric fields.• Electric charge.
Textbook:	Principles and Applications of Electrical Engineering by Giorgio Rizzoni and James A. Kearns, McGraw-Hill Education, 6th edition, 2015.
References:	<ol style="list-style-type: none">1. Electrical Engineering: Principles & Applications by Allan R. Hambley, Pearson, 7th edition, 2017.2. Fundamentals of Electric Circuits by Charles K. Alexander and Matthew Sadiku, McGraw-Hill Education, 6th edition, 2016.3. Electrical Circuits by James W. Nilsson and Susan Riedel, 11th edition, Pearson, 2018.4. Schaum's Outline of Basic Circuit Analysis by John O'Malley, McGraw-Hill Education, 2nd Edition, 2011.5. Schaum's Outline of Electric Circuits by Mahmood Nahvi and Joseph Edminister, McGraw-Hill Education, 7th Edition, 2011.6. Microelectronic Circuits by Adel S. Sedra and Kenneth C. Smith, Oxford University Press, 7th Edition, 2014.7. Microelectronics Circuit Analysis and Design by Donald A Neamen, McGraw-Hill Education, 4th edition, 2009.8. Schaum's Outline of Electronic Devices and Circuits by Jimmie J. Cathey, McGraw-Hill Education, 2nd Edition, 2002.
Schedule:	14 Weeks, 42 lectures (50 minutes each) plus exams.
Course goals:	The overall objective is to provide the student with the knowledge and proficiency to analyze DC circuits, R/L/C circuits with DC or sinusoidal forcing functions, steady-state AC circuits both single and multiphase, and basic electronic circuits.

Course learning outcomes (CLO) and relation to ABET student outcomes (SO):

Upon successful completion of this course, a student will:	[SO]
1. Understand the definitions of basic electrical quantities, Ohm's law and differences between practical and ideal sources.	[1]
2. Analyze simple series and parallel resistive circuits and simplify series/parallel connected sources and resistors.	[1]
3. Implement general nodal and mesh analysis and other circuit analysis technique.	[1]
4. Understand the concept of the sinusoidal forcing function and analyze R/L/C circuits in the frequency domain and convert the solution to the time domain.	[1]
5. Understand and analyze steady-state three-phase AC circuits, and be able to perform power calculations.	[1]

Course topics:

	Hrs
1. Units, charge, current, voltage, and power. Dependent and independent voltage and current sources. Ohm's law.	4
2. Nodes, paths, loops, and branches. Kirchoff's current and voltage laws. Single node or loop circuits. Reduction of series or parallel circuits. Voltage and current division.	5
3. Nodal analysis. Mesh analysis. Nodal versus mesh analysis. Computer aided circuit analysis.	6
4. Linearity and superposition. Source transformations. Thevenin theorem. Maximum power transfer. Delta–Wye conversion.	6
5. The capacitor and inductor. Inductance and capacitance combinations.	3
6. Characteristics of sinusoids. Forced response to sinusoidal functions. Relation between frequency and time domains. The phasor and relationships for R, L, and C elements. Impedance and admittance. Circuit analysis techniques. Phasor diagrams.	10
7. Three-phase circuits, Wye and delta balanced loads. Power calculations for single- and three-phase circuits. Power factor and power triangle.	6

Course Policies/

Attendance is required and highly encouraged. To that end, attendance will be taken every lecture. Eating and drinking are not allowed during class, and cell phones must be set to silent mode. All exams (including the final exam) should be considered cumulative. Exams are closed book. No scratch paper is allowed. You will be held responsible for all reading material assigned, even if it is not explicitly covered in lecture notes.

Academic Integrity:

You are encouraged to study together and to discuss information and concepts covered in class with other students. You can give "consulting" help to or receive "consulting" help from such students. However, this should never involve one student having possession of a copy of all or part of work done by someone else. Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero on the assignment.

Assessments:	Exams	Grade
Grading policy:	1st Exam	25%
	2nd Exam	25%
	Final Exam	50 %
	Total	100%

Last Revised: February 2025