



Jordan University of Science and Technology
Faculty of Engineering
Biomedical Engineering Department

BME311 Electric Circuits Lab

First Semester 2023-2024

Course Catalog

1 Credit Hours. 1 Credit hour (3 hrs. lab) The Electric Circuits lab focuses on experiments that cover the following topics: Resistors, Potentiometers and Rheostats, DC circuit measurements: Kirchhoff's current and voltage laws, Current-limited DC power supply characteristics, circuit loading by measurement equipment, Mesh and nodal analysis, superposition, Thevenin's and maximum power transfer theorems, inductance and capacitance I-V relations, RL and RC circuit transients, RLC circuit transients, Sinusoidal AC circuit measurements, Series and parallel resonance.

Text Book

Title	Engineering Circuit Analysis
Author(s)	W. H. Hayt, Jr., J. E. Kemmerly, and S.M. Durbin
Edition	6th Edition
Short Name	REF
Other Information	...

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref#2	The Analysis and Design of Linear Circuits	R.E.Thomas and A.J.Rosa	5th Edition	...

Instructor

Name	Dr. Hossam H El-Khalil
Office Location	-
Office Hours	Sun : 13:00 - 13:30 Mon : 11:00 - 11:30 Tue : 11:00 - 14:00 Wed : 11:00 - 13:00
Email	hmhelkhalil@just.edu.jo

Class Schedule & Room	
Section 1:	Lecture Time: Sun : 14:30 - 17:30 Room: LAB
Section 2:	Lecture Time: Mon : 14:30 - 17:30 Room: LAB
Section 3:	Lecture Time: Wed : 14:30 - 17:30 Room: LAB

Prerequisites		
Line Number	Course Name	Prerequisite Type
282120	BME212 Electric Circuit Analysis	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Drop and add period	
Week 2	Introduction to the Course & Lab	
Week 3	Resistors, Potentiometers and Rheostats	
Week 4	DC circuit measurements: Kirchhoff's current and voltage laws, series, parallel and series-parallel circuits	
Week 5	laboratory Instrument Loading Effect Part-A: Current-limited DC power supply characteristics, circuit loading by measurement equipment	
Week 6	DC circuit analysis: Mesh and nodal analysis, superposition, Thevenin's and maximum power transfer theorems, source transformations	
Weeks 7, 8	laboratory Instrument Loading Effect Part-B: circuit loading by measurement equipment.	
Week 9	Circuits Inductance, Capacitance I-V Relations and Transients in RL and RC	
Week 10	Transients in RLC Circuits: the under-damped, critically damped, and over-damped cases	
Week 11	Sinusoidal AC circuit measurements: Phase angle, average power and power factor (p.f.), phasors, Thevenin's and maximum power transfer theorems	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Give the student a quick exposure to the laboratory equipment which will be used in this lab. [1SO1, 1SO2, 1SO5, 1SO6, 1SO7]	10%	
Ability to use test and measurement equipment like multi-meter, power supply, function generator and oscilloscope. Gain familiarity with available types of resistors, potentiometers, and rheostats. [1SO1, 1SO5, 1SO6]	25%	
Verify DC circuit theorems experimentally. [1SO1, 1SO5, 1SO6]	25%	
Ability to measure AC voltage magnitude and phase. [1SO1, 1SO5, 1SO6]	20%	
Ability to measure the frequency response of various types of simple RLC filters. [1SO1, 1SO5, 1SO6]	20%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
32	2			32	32	2

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