MUTAH UNIVERSITY
Faculty of Engineering
Department of Electrical Engineering

Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0401211	Electric Circuits (1)	3	3 T

INSTRUCTOR/COORDINATOR	
Name	Dr. Saqer S. Alja'Afreh
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Office Hours	12:30-14:00 (Mon, Wed)
Classroom Time	11:00-12:30 (Mon, Wed)

TEXTBOOK	
Title	Fundamentals of Electric Circuits
Author/Year/Edition	Charles K. Alexander, Matthew N.O. Sadiku, McGraw Hill/2012/ 5th Ed
Other Supplemental Materials	
Title	Electric Circuits Analysis
Author/Year/Edition	William Hayt and Jack Kemmerly and Jamie Phillips and Steven Durbin/ 2019/9th Edition

SPECIFIC COURSE INFORMATION

A. Brief Description of the Content of the Course (Catalog Description)

Fundamental principles of circuit theory commonly used in engineering research and scientific applications. Techniques and principles of electrical circuit analysis, including basic concepts such as voltage, current, resistance, impedance, Ohm's and Kirchhoff's law; basic electric circuit analysis techniques, resistive circuits, transient and steady-state response of RLC circuits; circuits with AC and sinusoidal sources, Power Calculations.

B. Pre-requisites (P) or Co-requisites (C)

General Physics (2) (0302102) **(P)**

C. Course Type (Required or Elective)

Required

SPECIFIC GOALS

A. Course Learning Objectives (CLOs)

By the end of this course, the student should be able to:
CLO1: Analyze DC and AC circuits using basic circuits' laws [1]
CLO2: Understand and apply circuit theorems in **analyzing** electric circuits [1].
CLO3: Analyze first order circuits (RL, RC), and second order circuits (RLC circuits) for both step and natural response [1].
CLO4: Analyze sinusoidal steady state circuit involving R, L and C [1].
CLO5: Calculate AC Power for different kinds of loads [1].

B. Student Learning Outcomes (SOs) Addressed by the Course

1	2	3	4	5	6	7
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BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
Chapter 1: Basic Concepts: Electric charge, current, voltage, power and energy, electric circuit elements	1	3
Chapter 2: Basic Laws: Ohm's law, Kirchhoff's laws, Nodes, meshes, loops, equivalent resistance in series and parallel connections, Delta and Star transformations, current division and voltage division	1	3
Chapter 3: Methods of Analysis: Nodal, Mesh.	2	6
Chapter 4: Circuit Theorems: superposition, Norton and Thevenin theorems, source transformation	2	6
Chapter 5: Operational Amplifiers: Ideal Op amp, Non-inverting amplifier, inverting amplifier, summer	1	3
Chapter 6; Capacitors and Inductors: Chapter 7: First order circuits (RL and RC circuits)	2	6
Chapter 8: Second order circuits (RLC and LC circuits)	1.5	4
Chapter 9: Sinusoids and Phasors	1	3
Chapter 10: Sinusoidal steady state analysis	1.5	5
Chapter 11: AC power analysis	1	3
Total	*14*	*42*

EVALUATION

Assessment Tool	Due Date	Weight (%)
Mid Exam	According to the university calendar	30

Course Work (Homeworks, Quizzes, , …etc.)	One week after being assigned	20
Final Exam	According to the university calendar	50

ABET's Students Learning Outcomes (Criterion # 3)		
	Relationship to program outcomes	
ABET 1-7		**Engineering Student Outcomes**
1	√	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2		an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3		an ability to communicate effectively with a range of audiences.
4		an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5		an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6		an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7		an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.