

MUTAH UNIVERSITY
Faculty of Engineering
Department of Electrical Engineering



Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0401252	Electromagnetics	3	3 T

INSTRUCTOR/COORDINATOR

Name	Dr. Rula Alrawashdeh
Email	rular18@mutah.edu.jo rularsr18@gmail.com
Office Hours	13:00-14:00 (Sun, Tues, Thur)

TEXTBOOK

Title	Elements of Electromagnetics
Author/Year/Edition	Matthew N.O. Sadiku, McGraw Hill/2010/ 5 th Edition
Other Supplemental Materials	
Title	1. Engineering Electromagnetics. 2. Introduction to Electrodynamics
Author/Year/Edition	1. Hayt/ 2011/8 th Edition 2. David. J. Griffiths/2013/ 4 th Edition

SPECIFIC COURSE INFORMATION

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

Electrostatic fields and steady magnetic fields laws and theories, forces, materials, resistance calculations, capacitance calculations, Inductance calculations, Laplace's and Poisson's equations and introduction to time varying fields. Maxwell's Equations.

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

Engineering Analysis (0401200) (P)

C. Course Type (Required or Elective)

Required

SPECIFIC GOALS

A. Course Learning Outcomes (CLOs)

By the end of this course, the student should be able to:

CLO1: Analyze and understand of basic static electromagnetic field concepts [1].

CLO2: Ability to calculate static fields, forces and potentials for different arrangements [1].

CLO3: Ability to solve boundary-value problems for static electric fields [1].

CLO4: Ability to calculate capacitance, inductance and resistance of some structures [1].

CLO5: Ability to evaluate the induced voltage and current in time varying fields' problem [1].

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

1	2	3	4	5	6	7
✓						

BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
Coulombs law and Electric fields due to point charge and charge distributions	1	3
Gauss's Law	1	3
Electric Potential Calculation and Electrostatic Energy. Relation of V and E	2	6
Electric Materials (Conductors and Dielectrics) and Electric Dipole	1	3
Boundary Value Problem (Laplace equation, Poisson Equation and the Method of Image) in Electrostatic and its applications in resistance calculations (in steady state dc current) and capacitance calculations	3	9
Magneto static field Fundamental laws, Boit-Savart Law and Ampere's Law	2	6
Magnetic Gauss's Law and Magnetic Flux, Magnetic Force	1	3
Inductance Calculations	1.5	5
Time Varying Fields, Faraday's Law, Maxwell's Equations, Displacement Current	1.5	4
<i>Total</i>	<i>14</i>	<i>42</i>

EVALUATION

Assessment Tool	Due Date	Weight (%)
Mid Exam	According to the university calendar	30
Course Work (Homeworks, Quizzes, Projects, ...etc.)	One week after being assigned	20
Final Exam	According to the university calendar	50

ABET's Students Learning Outcomes (Criterion # 3)

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.