

**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**

<b>Name</b>	Dr. Rula Alrawashdeh
<b>Email</b>	<a href="mailto:rular18@mutah.edu.jo">rular18@mutah.edu.jo</a> <a href="mailto:rularsr18@gmail.com">rularsr18@gmail.com</a>
<b>Office Hours</b>	13:00-14:00 (Sun, Tues, Thur)

**TEXTBOOK**

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