Hashemite University
College of Engineering
Department of Electrical Engineering
EE 110409221-Electromagnitic I (3 Credit Hours/Dept. Compulsory)

Instructor

Omar A Saraereh				
Email:	Eloas2@hu.edu.jo			
Office:	Eng. 3067			
Office hours:	1:00-2:00 PM (Daily)			

Grading info

Midterm	40%
Quizzes	20%
Final	40%

Class Info

Days	Sun/Tue/Thu
Time	9:00-10:00 AM
Location	Online

Course

Course Number:	110409221
Prerequisite:	Physics II (0102102) and Calculus III (110101201) • Knowledge of physics, calculus and Multivariate Calculus. Magnetism: magnetic field and magnetic forces, electromagnetic induction and waves, Vector calculus, partial derivatives, and multiple integrals
Textbook:	**"Fundamentals of Applied Electromagnetics",** Fawwaz T. Ulaby, Chapter (3-6), Prentice Hall, 2015. Edition 7.
Course Description:	Review of vector analysis, Divergence and Stokes's theorem, electrostatic fields, Coulomb's law, unbound electric fields, electrostatic boundary-value problems, Magnetostatic fields, Maxwell's equations for static EM fields. Magnetic force, Torque, and Moment. Magnetic materials, magnetic devices. Faraday's law, Displacement current, Time varying potentials, and Maxwell's equations for time varying fields.
Specific Outcomes of Instruction (Course Learning Outcomes):	1. Implement Coulomb's law and Gauss's law to find the electrostatic fields, potential, and capacitance. (a, e) 2. Implement Biot Savart's law and Ampere's law to find the magnetostatic fields and inductance.(a, e) 3. Recognize the behavior of electric and magnetic fields in the presence of dielectric and magnetic material boundaries. (a, e) 4. Apply Maxwell's Equations for time-harmonic fields and Faraday's law. (a, e) 5. Analyze electromagnetic through boundaries between media. (a, e)
Important material	- Lecture notes - References

References:

- Mathew N. O. Sadiku, "Elements of Electromagnetics", Third edition, Oxford University Press 2001.
- Constantine A. Balanis, "Antenna Theory: Analysis and Design", 2nd Edition, Wiley, 1996.
- Joseph A. E., "Theory and Problems of Electromagnetics" 2/ed, Shaum's Outline Series.

Major Topics Covered and Schedule in Weeks:

Topic	# Weeks	# Contact hours
Review of Vector Algebra & Review of Coordinate System and Transformation	2	6
Review of Vector Calculus	3	9
Electrostatic Fields and Electric Fields in Material	3	9
Magnetostatic Fields, Magnetic Forces and Materials	4	16
Maxwell's Equations for time-harmonic fields and Faraday's law	3	9
Total	**15**	**45**

Course Policy

- Student Outcomes (SO) Addressed by the Course:

#	Outcome Description	Contribution
General Engineering Student Outcomes		
(a)	An ability to apply knowledge of mathematics, science, and engineering	H
(b)	An ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
(d)	An ability to function on multidisciplinary teams	
(e)	An ability to identify, formulate, and solve engineering problems	H
(f)	An understanding of professional and ethical responsibility	
(g)	An ability to communicate effectively	
(h)	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	A recognition of the need for, and an ability to engage in life-long learning	
(j)	A knowledge of contemporary issues	
(k)	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	M

H=High, **M**= Medium, **L**=Low