



The Hashemite University
Faculty of Science
Department of Physics

Course Title:	Electromagnetism (2)	Course Number:	110102332
Semester:	Spring	Year:	2022/2023
Designation:	Compulsory	Prerequisite(s):	110102331
Instructor:	Dr. Gassem Alzoubi	Instructor's e-mail:	gassem@hu.edu.jo
		Webpage:	http://staff.hu.edu.jo/gassem
Office Hours:	Sunday, Tuesday, and Thursday, 10–11 Am and 12-1 Pm, Phys Building, Room # 107		

Course Description (catalog): Physics 332 is the second course of our two-semester sequence of classical electromagnetism. It introduces students to a variety of topics in electricity and magnetism, mainly dynamic properties of electromagnetic fields. Topics covered in this course include magnetic fields in matter, electromotive force, electromotive induction, Maxwell's equations, the continuity equation, Poynting's theorem and conservation of momentum, electromagnetic waves, and wave guides.

Textbook(s) and/or Other Supplementary Materials:

Textbook: Introduction to Electrodynamics, Fourth Edition by David J. Griffiths (Cambridge University Press, 2017)

References:

- (1) Electromagnetism, First edition by Pollack and Stump (Addison-Wesley, 2001),
- (2) Electricity and Magnetism, Illustrated edition, by Nayfeh & Brussel (Dover Publications, 2015)

Major Topics Covered:

Topics	No. of Weeks	Contact hours*	Chapter in Text	Sections	Suggested Problems (from textbook 4 th edition)
Magnetic Fields in Matter	4	12	6	6.1-6.4	HW#10: 6.1, 6.8, 6.12, 6.15 HW#11: 6.16, 6.17, 6.18, 6.21, 6.24, 6.26
Electrodynamics	4	12	7	7.1-7.3	HW#12: 7.1, 7.2, 7.3, 7.4, 7.5, 7.7, 7.8, 7.10, HW#13: 7.12, 7.13, 7.15, 7.16, 7.17, 7.18, HW#14: 7.23, 7.28, 7.29, 7.30, 7.31, 7.36,
First Exam					
Conservation Laws	3	9	8	8.1-8.3	HW#15: 8.1, solenoid problem
Second Exam					
Electromagnetic Waves	4	12	9	9.1-9.5	HW#16: 9.9, 9.14, 9.15, 9.18, 9.20, 9.21, 9.22, 9.29
Final Exam					
Total	15	45			

*Contact hours include lectures and exams

Specific Outcomes of Instruction (Course Learning Outcomes):

After completing the course, the student will be able to:

	Course Learning Outcomes (CLO)	(SO*)
CLO1.	Develop a clear understanding of basic physical concepts in electrodynamics as an integral part of the student's overall education	(a), (k), (i)
CLO2.	Use vector calculus in solving problems in electrodynamics	(a), (k)
CLO3.	Provide detailed and accurate descriptions of of coulomb's law, Laplace's Equation and its applications, solution of Laplace's Equation using method of images, separation of variables, and multipole expansion, polarization and linear dielectrics, the Lorentz force law, the Biot-Savart law, magnetic, Ampère's Law, and vector potential	(a), (e) (k)

(SO*) = Student Outcomes Addressed by the Course.

Student Outcomes (SO) Addressed by the Course:

#	Outcomes Description	Contribution
	Applied and Natural Sciences Student Outcomes	
(a)	an ability to apply knowledge of mathematics, science, and applied sciences	H
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to formulate or design a system, process or program to meet desired needs	
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify and solve applied sciences problems	L
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of solutions in a global 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 scientific and technical tools necessary for professional practice.	M
H = High, M = Medium, L = Low		

Grading Plan:

1 st Exam	30 Points	TBA
2nd Exam	30 Points	TBA
Final exam	40 Points	TBA

General Notes: **Attendance Policy:** students are expected to attend every class and arrive on time in compliance with HU regulations. In case you find yourself in a situation that prevents you from attending class or exam, you have to inform your instructor. If you miss more than 6 classes for the (Sunday, Tuesday, and Thursday model) or 4 classes for the (Monday and Wednesday Model), you cannot pass the course. Makeup excuses will be accepted only for very limited justified cases, such as illness and emergencies.

Prepared by: Dr. Gassem Alzoubi **Date:** Feb, 26, 2023