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|  | **Hashemite University**  **College of Engineering**  **Department of Electrical Engineering**  **EE 110409324 -** **Electromagnetic II (3 Credit Hours/Dept. Compulsory)[[1]](#footnote-1)** | | | | | | | | | |  |
| **Instructor** | | | |  | **Grading info** | | |  | **Class Info** | | |
| Omar A Saraereh | |  | |  | Midterm | | 40% |  | Days | Sun-to-wed | |
| Email: | | Eloas2@hu.edu.jo | |  | Quizzes | | 20% |  | Time | 11:00-12:15 PM  Sec 2 | |
| Office: | | Eng. 3067 | |  | Final | | 40% |  | Location | Online | |
|  | |  | |  |  | |  |  |
| Office hours: | | 2:00-3:00 PM (Daily) | |  |  | |  |  |  |  | |
| **Course** | | | | | | | | | | | |
| Course Number: | | 110409203 | | | | | | | | | |
| Prerequisite: | | |  | | --- | | Electromagnetic I (110409221) | | | | | | | | | | |
| Textbook: | | **“Fundamentals of Applied Electromagnetics”,** Fawwaz T. Ulaby, Prentice Hall, 7th Edition, 2015. | | | | | | | | | |
| Course Description: | | Wave propagation in lossy dielectrics, plane waves in lossless dielectrics, plane waves in free space, power and poynting vector, reflection of plane waves at normal incidence, reflection of plane waves at oblique incidence, transmission lines: parameters, equations, and applications. Smith chart. Waveguides: rectangular waveguides, TE and TM modes. Introduction to antennas. | | | | | | | | | |
| Specific Outcomes of Instruction (Course Learning Outcomes): | | 1. Develop an understanding of various concepts and theorems in time varying electromagnetic waves and their applications. (a, e) 2. Investigate the EM wave propagation through different media. (a, e) 3. Understand the basics of plane wave propagation in lossless and lossy materials. (a, e) 4. Solve basic plane wave propagation problems: normal and oblique incidence on planar boundary. (a, e) 5. Identify the characteristics of transmission lines and transmission line circuits.(a, e) 6. Apply the Smith chart to the analysis and design of transmission line matching circuits. (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** | | | | | |
| Introduction | | | 1 | | | 3 | | | | | |
| Maxwell’s equations for time varying fields | | | 3 | | | 9 | | | | | |
| Plane wave propagation | | | 3 | | | 9 | | | | | |
| Wave reflection and transmission | | | 3 | | | 9 | | | | | |
| Transmission lines | | | 3 | | | 9 | | | | | |
| Waveguides | | | 2 | | | 6 | | | | | |
| Total | | | 15 | | | 45 | | | | | |
| **Course Policy** | | | | | | | | | | | |
|  | | | | | | | | | | | |
| * If you miss class, there won’t be a makeup test, quiz, etc. and you WILL get a zero unless you have a valid excuse. * Cheating and plagiarism are completely prohibited. * If you miss more than 15% of classes you will automatically fail the class. | | | | | | | | | | | |
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| * Student Outcomes (SO) Addressed by the Course: | | | | | | | | | | | |

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| **#** | **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 |  |

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

1. Summer Semester (2020-2021) [↑](#footnote-ref-1)