Electromagnetics (1) - 8021310-3

Course Syllabus

Prerequisites:	Physics II (4031002-4) & Engineering Mathematics II (8002002-4).
Course Units:	Lecture Units: 3 Lab Units: 0 Total Units: 3 Contact Hours: 3
Professor's Details:	**Name:** Dr. Mouaaz Nahas **Office:** Room 1207 (First Floor, Electrical Engineering Department) **Email:** mouaaz.nahas@googlemail.com **Webpage:** https://uqu.edu.sa/mmnahas
Course Contents:	*Note that the topics outlined here may be adjusted as necessary.* 1. Vector Algebra – (Chapter 1). 2. Coordinate Systems – (Chapter 2). 3. Vector Calculus – (Chapter 3). 4. Electrostatic Fields – (Chapter 4). 5. Resistance and Capacitance – (Chapter 6). 6. Electrostatic Boundary Value Problems – (Chapter 6). 7. Magnetostatic Fields – (Chapter 7). 8. Magnetic Force, Torque and Inductance – (Chapter 8). 9. Time-Varying Electromagnetic Fields – (Chapter 9). 10. Maxwell's Equations – (Chapter 9).
Course Learning Outcomes (CLOs):	1. How to apply vector operations (Gradient, Divergence, Curl and Laplacian) for Electromagnetic fields. 2. Calculate both Electric and Magnetic Field Intensities and Flux densities for different configurations. 3. Apply Laplace's and Poisson's equations on simple configurations. 4. Solve the formulas of the forces and torques due to magnetic field in different configurations. 5. Calculate the induced voltage for time varying electromagnetic fields. 6. Concepts and practical meaning of Maxwell's equations (Faraday's law, Ampere's law, Gauss's law and conservation of charge). 7. Apply knowledge about the importance and the application of Electromagnetic in electrical engineering (communication, electronics, computer, radar, electrical machines, transformer, cables and power transmission system).
Textbooks:	M. N. O. Sadiku, *Elements of Electromagnetics*. Oxford University Press, 2015.
References:	1. W. H. Hayt and J. A. Buck, *Engineering Electromagnetics*. McGraw-Hill, 2012. 2. D. K. Cheng, *Fundamentals of Engineering Electromagnetics*. Addison-Wesley Publishing Company, 1993. 3. J. D. Kraus, *Electromagnetics with Applications*. McGraw-Hill College, 1998. 4. F. T. Ulaby and U. Ravaioli, *Fundamentals of Applied Electromagnetics*. Pearson Education, 2015.
Grading System:	See the professor's webpage listed above.