Course Syllabus	**EECS 3710 – Electromagnetics I**
Credits & Contact Hours	3 credit hours & three 50-minute lecture contact hours per week
Instructor's Name	Dr. Richard G. Molyet
Textbook	F. T. Ulaby, E. Michielssen, U. Ravaioli "Fundamentals of Applied Electromagnetics", Pearson, 7th Edition, 2015
Course Information	The nature of electromagnetism, Complex numbers, Transmission lines, Smith chart, Impedance matching, Vector analysis, Coordinate transformations, Electrostatics, Electrical properties of materials, Boundary conditions, Magnetostatics, Magnetic properties of materials, Boundary conditions. Prerequisites: EECS 2300 and MATH 2860 and PHYS 2140 Required course for EE program
Specific Goals - Student Learning Objectives (SLOs)	The student will be able to 1. Apply the basics of harmonic waves and the phasor technique in solving relevant problems. 2. Apply knowledge on vectors, vector calculus, and orthogonal coordinate systems in solving problems, relevant to electromagnetics. 3. Apply the acquired electrostatics knowledge, which includes topics such as Coulomb's law, Gauss' law, Maxwell's equations, electric field boundary conditions, and electrostatic potential, in basic electric field and potential calculations. 4. Use knowledge on materials and their electrical properties, as well as related concepts of resistance, capacitance, and electrostatic energy, in basic analysis and design problems. 5. Apply the acquired magnetostatics knowledge, which includes topics such as magnetic forces and torques, Biot-Savart's and Ampere's laws, magnetic field boundary conditions and vector magnetic potential, in basic magnetic field and potential calculations. 6. Use knowledge on materials and their magnetic properties, as well as related concepts of inductance and magnetic energy, in basic analysis and design problems. 7. Apply the acquired knowledge on Maxwell's equations for time-varying fields, and the related results and concepts in basic problems and calculations.

8. Apply the principles of transformers, electromagnetic generation and actuation, and free-charge dissipation in conductors, in simple analysis of relevant electromagnetic systems and in solving basic problems.

Topics

1. Introduction to Waves and Phasors
2. Transmission Lines
3. Vector Analysis
4. Electrostatics
5. Magnetostatics
6. Maxwell's Equations for Time-Varying Fields
7. Plane-Wave Propagation)