

Applied Electromagnetism

Instructor: Neil Williams

Class Schedule:

Location:

Office Hours:

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Course URL: www.u.tt/ict

This is an undergraduate course on electromagnetism and its applications. The first part of the course discusses the concepts of electrostatics. Topics in this area include Coulomb's law, electric field intensity, Gauss' law, work, electric potential, current density and Poisson and Laplace's equations. The second part of this course deals with magnetostatics. This area will explore topics such as Biot-Savart law, Ampere's law and magnetic flux density. Also, Faraday's law, Maxwell's equations and wave propagation are investigated.

Prerequisite ELEC 206 - Electric Circuit Theory

Assessment

Quiz 1 20 %

Quiz 2 20 %

Final Examination 60 %

Textbook Field and Wave Electromagnetics – David K. Cheng, 2nd Edition

Course Schedule

Date	Topics and Reading
Week 1, Sept. 8	Review of Vector Algebra Co-ordinate Systems Differential Line, Surface and Volume Elements
Week 2, Sept. 15	Coulomb's Law and its Applications Electric Field Intensity Charge Distributions
Week 3, Sept. 22	Electric Flux and Electric Flux Density Gauss' Law and its Applications Gaussian Surfaces
Week 4, Sept. 29	The Del Operator Divergence Theorem The Electrostatic Field Work and Electric Potential
Week 5, Oct. 6	Potential of a point Charge Potential of Charge Distributions Gradient and Energy in Static Electric Fields
Week 6, Oct. 13	QUIZ 1 (20 %) Concept of Current Density and Conductivity Polarization and Relative Permittivity
Week 7, Oct. 20	Capacitance Energy Stored in a Capacitor Poisson's and Laplace's Equations
Week 8, Oct. 27	Solution to Laplace's Equation Biot-Savart Law and its Applications
Week 9, Nov. 3	Ampere's Law and its Applications Magnetic Flux Density Displacement Current
Week 10, Nov. 10	QUIZ 2 (20 %) Induced EMF Faraday's and Lenz's Law
Week 11, Nov. 17	Maxwell's Equations Maxwell's Equations in Point and Integral Forms Wave Propagation
Week 12, Nov. 24	Review