

Class: M.Sc Previous

Subject Name: Electromagnetic Theory

Recommended Book: Engineering Electromagnetics

by W H Hayt and J A Buck, 7-th Edition (The pdf file of the book can be download from the uploaded online contents of the course).

Lecture 1: The spherical coordinate system

Lecture 2: Field of a line charge, field of a sheet of charge, streamlines and sketches with examples

Lecture 3: Electric flux density, Gauss' law and its applications with examples

Lecture 4: Divergence, Maxwell's first equation and Vector Operator

Lecture 5: Energy expended in moving a point charge in an electric field, the line integral, definition of a potential difference and potential with examples

Lecture 6: The potential field of a point charge, system of charges and potential gradient with examples

Lecture 7: The dipole, energy density in an electric field with examples

Lecture 8: Current and current density, current continuity, conductor properties and boundary conditions with examples

Lecture 9: Nature of dielectric materials, boundary conditions for perfect dielectric materials with examples

Lecture 10: Capacitance, several capacitance examples

Lecture 11: Capacitance of a two wire lines, streamline sketches and current analogies

Lecture 12: Poisson and Laplace's equations, uniqueness theorem

Lecture 13: Examples of solutions of Laplace's equation

Lecture 14: Examples of solutions of Poisson's equations

Lecture 15: Product solution of Laplace's equation

Lecture 16: Biot-Savart law and Ampere's circuital law

Lecture 17: Curl and Stoke's theorem with examples

Lecture 18: Magnetic flux and magnetic flux density

Lecture 19: The scalar and vector magnetic potential

Lecture 20: Derivation of the steady magnetic field laws