

BS (4 Years) for Affiliated Colleges



Code	Subject Title	Cr. Hrs	Semester
PHY-402	CLASSICAL ELECTRODYNAMICS-I	3	VII
Year	Discipline		
4	Physics		

Course Outlines:

Equation of Poisson and Laplace, applications of Laplace's equation to problems (conductors and dielectrics) having spherical cylindrical and Cartesian symmetry, electrical images (conductors and dielectrics).

Electric Current: Nature of the current, current density and equation of continuity, Ohm's law, steady current in media without sources of e.m.f., approach to electrostatic equilibrium.

Magnetic induction, force on current carrying conductors, Biot-Sawart law, Ampere's circuital law, the magnetic vector and scalar potentials, the magnetic field of a distant circuit.

Magnetic Properties of Matter: Magnetisation, vectors M and H produced by magnetized materials field equation, boundary conditions on the field vectors.

Maxwell's Equations and their Applications: Maxwell's equations and the generalization of the Ampere's law, electromagnetic energy, vector and scalar potentials, gauge transformations (Lorentz gauge, coulombs guage), pressure of radiations.

Books Recommended:

1. *Classical Electrodynamics* by Jackson, Wiley, 1975.
2. *Electricity and Magnetism* by W. J. Duffin, McGraw-Hill, 1990.
3. *Electromagnetism* by I.S. Grant and W. R. Phillips Wiley, 1990.
4. *Introduction to Electrodynamics* by D. Griffiths Prentice Hall, 1989.