

Department of Physics

Indian Institute of Technology Kanpur

PHY603 : Review of Classical Electrodynamics

Course content:

S. No.	Topics	No. of Lecture and Tutorial Hours
1	Problem oriented review of Classical Electrodynamics. Electrostatics and Magnetostatics: Methods of solving electrostatic problems in cartesian, spherical and cylindrical coordinates, Green's function and Boundary value problems, both analytical and numerical solutions. Multipole expansion, Macroscopic media, Dielectrics and Magnetic media.	12
2	Electrodynamics: Faraday's law, Displacement current, Poynting Vector, Conservation laws. Electromagnetic waves in free space and different media, waveguides.	10
3	Radiation: Retarded potential, electric and magnetic dipole fields, linear antenna. Special Relativity: Transformation of electromagnetic fields.	10
4	Scattering and diffraction, Resonant cavities, Optical fibers, Dispersion.	8

Reference books:

1. J. D. Jackson, Classical Electrodynamics.
2. Landau and Lifshitz, Electrodynamics of continuous media.
3. Griffiths, Electrodynamics.
4. Zangwill, Electrodynamics.
5. Reitz, Christy and Millford, Electrodynamics.