

PH1020: PHYSICS II

Course Content:

Unit 1: Electrostatics and magnetostatics Maxwell's equation-I, work and energy in electrostatics, displacement and polarization, boundary conditions. Maxwell's equation-II, Ampere's law, magnetic vector potential, magnetism in matter. Unit 2: Electrodynamics and electromagnetic radiation Lorentz force, Faraday's law and Lenz's law, electromagnetic induction. Displacement current, Maxwell's equations III and IV, energy stored in an electromagnetic field, electromagnetic waves in vacuum and in matter, Snell's law. Unit 3: Introduction to quantum mechanics The quantum nature of radiation, interference experiment with radiation and particle beams. Postulates of quantum mechanics, Schrodinger wave equation. Applications to simple physical systems such as free particle, particle in a box and barrier penetration, spin, two-state systems.

Text Books:

1. Introduction to Electrodynamics **David J. Griffiths**, Pearson Education India Learning Private Limited; 4 Edition, 2015
2. Intro to Quantum Mechanics **David J. Griffiths**, Pearson Education India Learning Private Limited, 2015
3. Fundamentals of Physics II - Electromagnetism, Optics, and Quantum Mechanics: 2 (The Open Yale Courses) **R. Shankar** Yale University Press; 1 edition, 2016

Reference Books:

1. The Feynman Lectures on Physics Vol 2, **Richard P. Feynman and R. B. Leighton** Narosa Publishing House, 2008
2. The Feynman Lectures on Physics Vol 3, **Richard P. Feynman and R. B. Leighton** Narosa Book Distributors, 2008
3. Quantum Physics **H C Verma**, TBS, 2nd edition, 2012

Prerequisite:

None