

Lesson Plan (2025-26) - Odd Semester
Name of Extension Lecturer : Dr. Ashok Kumar
Class : B.Sc. 3rd YEAR (5th semester)
Subject : PHYSICS

Week	Topics
1	Crystalline and Glassy forms of solid, Liquid crystals. Crystal structure, Periodicity , Lattice and Basis, Crystal translational vectors and axes, Unit cell and Primitive cell , Wigner Seitz Primitive Cell, Symmetry Operations for a two dimensional crystal, Bravais Lattices in two and three dimensions. Chapter Problems
2	Crystal Planes and Miller indices, interplanar spacing, Crystal structure of Zinc Sulphide , Sodium Chloride and Diamond, X –ray diffraction, Bragg’s Law and experimental X-ray diffraction methods, K-space . Chapter Problems
3	Reciprocal Lattice and its physical significance, Reciprocal Lattice vectors, reciprocal lattice to a simple cubic lattice, B.C.C. and F.C.C. Chapter Problems
4	Specific Heat : Specific heat of a solids, Einstein’s theory of specific heat, Debye model of specific heat of solids. Chapter Problems
5	Failure of Classical E.M. Theory, Quantum theory of radiation (old Quantum theory), Photon, Photoelectric effect and Einstein Photoelectric equation, Compton effect

6	Inadequacy of old Quantum theory, De-Broglie Hypothesis, Davisson and Germer experiment, G.P. Thomson experiment, Phase Velocity, Group Velocity, Heisenberg Uncertainty Principal.
7	Time Energy and angular momentum, Position Uncertainty Principle, Wave Particle Duality, Gamma Ray Microscope, Electron diffraction from a slit. Chapter Problems
8	Derivation of time dependent Schrodinger Wave equation, Eigen values, Eigen functions, Wave functions and its significance, Normalization of Wave function, concept of observable and Operator.
9	Solution of Schrodinger equation for harmonic oscillator ground state and excited states. Chapter Problems
10	Application of Schrodinger equation in the solution of the following one dimensional Problems, Free Particle in one dimensional box, Solution of Schrodinger Wave equation, Eigen Function, Eigen Values, Quantization of energy and momentum, Nodes and Antinodes, Zero point energy. Chapter Problems
11	One - dimensional potential barrier $E > V$ (Reflection and Transmission Coefficient.) One - dimensional potential barrier, $E > V$ (Reflection Coefficient, Penetration of leakage Coefficient , Penetration depth). Chapter Problems