LESSON PLAN (2025-26)	
Name of the Assistant Professor: **DR. S. B. BHARDWAJ**	
Class and Section **B.Sc.III (5th Sem)**	
Subject: **Physics (Modern Physics) (w.e.f.from Aug. 2025)**	

Week	Topics
1	Unit-1 Introductory Quantum Mechanics: Need ofQuantum Mechanics, Planck's quantum hypothesis and radiation formula
	quantization of EM radiation and photoelectric effect, Compton effect
	deBroglie hypothesis, de-Broglie wave, wave packet
2	phase and group velocities
	Time-dependent and time- independent Schrodinger equations
	Properties of wave function, Probability current density, linear momentum and energy operators
3	commutator of position and linear momentum operator, expectation values of position and linear momentum
	particle confined in a one-dimensional infinite box: energy eigen functions and eigenvalues.
	Heisenberg's Uncertainty Principle and its applications
4	Revision of Heisenberg's Uncertainty Principle and its applications
	Class test of Unit-1
	Unit-2: Solid State Physics: Crystalline state, crystal lattice, basis, lattice translation vectors, primitive and non-primitive unit cells
5	symmetry operations
	Bravais lattices in two and three dimensions, Miller Indices
	crystallographic planes, interplanar spacing, simple crystal structures: NaCl, CsCl
6	crystal structures: HCP, Zinc blende, Diamond,
	Diffraction of waves by crystals, Bragg's law
	Idea of Reciprocal Lattice:Reciprocal lattice to sc, bcc and fcc lattices,
7	Reciprocal lattice to sc, bcc and fcc lattices
	non-crystalline solids (introduction only)
	Revision of Unit-2
8	Revision of Unit-2
	Class Test of Unit-2
	Unit-3: Atomic and Molecular Physics: Sommerfeld theory (qualitative), Relativistic correction
9	Fine structure of Hα line, Lamb shift
	Larmor's theorem (qualitative), Vector Atom Model, electron spin, space quantization
	spin-orbit Interaction energy,

10	LS and JJ coupling
	Spectral terms for equivalent and non-equivalent electrons,
	Anomalous Zeeman effect, Lande's g-factor, splitting of D1 and D2 lines in weak magnetic field
11	Raman effect, Stoke and Anti-stoke lines
	Revision of important topic of Unit-3
	Unit-4: Nuclear and Particle Physics: Composition of nucleus, stability of nucleus
12	nuclear properties, nuclear size, spin, parity, magnetic moment, quadrupole moment,
	Nuclear Models, Liquid Drop Model and Semiempirical Mass formula
	Liquid Drop Model and Semiempirical Mass formula
13	Nuclear shell model and magic numbers (qualitative idea only),
	classification of fundamental particles, Quark and Lepton quantum numbers
	Hadrons, Baryons and Mesons,
14	Different types of interaction forces
	Revision of Nuclear models
	Revision of fundamental particles

15	Class Test of Unit-4