

Lesson Plan for U.G. MDC 1st Semester Session - 2025-2026 (July to Nov 2025) Teacher Name: Dr. Pushpa Kumari	
July-Aug 2025	Unit 1 : Scientific Approach and Rational Thinking: Fundamentals of rational thinking, faith vs belief, the scientific method: observation, hypothesis, experimentation, and conclusion, origin of science through curiosity and inquiry, myth-busting discoveries in physics: heliocentrism (Copernicus, Galileo), gravity and motion (Newton), theory of relativity (Einstein), nature of lightning (Benjamin Franklin), Vacuum and air pressure.
Sept. 2025	Unit-II: Myths and Scientific Thinking: Science vs faith, science vs pseudoscience, definition, origin, and types of myths and beliefs, evolution of myths and misconceptions in explaining natural phenomena, influence of cultural and social beliefs on scientific progress, Darwin's theory as a case study in scientific thinking.
Oct. 2025	Unit-III : The Paradox of Science & Technology: Distinction between science and technology, understanding the science-technology acceptance paradox, case studies: acceptance and rejection of new technologies, rejection and resistance to scientific ideas, the future of Artificial Intelligence (AI) and its societal acceptance, potential problems in AI.
Nov. 2025	Unit-IV: Challenges in Promoting Rational Thinking: Barriers to rational thinking, role of education and media in promoting or hindering rationality, scientific temper, and constitutional duty: relevance in Indian context (Article 51A(h)), case studies: superstition and blind beliefs (e.g., astrology, miracle claims), science communication: importance of clear communication of science to the public

Lesson Plan for B.Sc. Physical Science 1st Semester
Session - 2025-2026 (July to Nov 2025)
Teacher Name: Dr. Pushpa Kumari

July-Aug 2025	Unit - I : Newton's Law: Newton's laws of motion, Mechanics of single and systems of particles, conservation of laws of linear momentum, angular momentum and mechanical energy, Central forces, fictitious forces. Rotational Dynamics: Rotation of a rigid body, Moment of inertia, torque, angular momentum, kinetic energy of rotation. Theorems of perpendicular and parallel axes with proof. Moment of inertia of simple systems, Kinetic energy of rotation. Motion involving both translation and rotation.
Sept2025	Unit II : Generalised Notations: Degrees of freedom and Generalised coordinates, Generalised Displacement, Velocity, Acceleration, Momentum, Force and Potential, Hamilton's variational principle, Lagrange's equation of motion from Hamilton's principle, Linear Harmonic oscillator, Simple pendulum, Atwood's machine
Oct2025	Unit - III : Elasticity: Elasticity, Hooke's law, Elastic constants and their relations, Poisson's ratio, torsion of a cylinder and twisting couple. Bending of beam (bending moment and its magnitude), cantilevers, and Dispersion of a centrally loaded beam supported at its ends
Nov2025	Unit - IV : Inertial and Non-Inertial Frames and their examples, Invariance of Newton's Laws of motion under Galilean transformations, Postulates of Special Theory of Relativity, Length Contraction, Time Dilation, Variation of Mass with Velocity, Mass-Energy Equivalence.

Lesson Plan for B.Sc. Physical Science 5th Semester
Session - 2025-2026 (July to Nov 2025)
Teacher Name: Dr. Pushpa Kumari

July-Aug 2025	Unit 1: crystalline and glassy solid, liquid crystals, crystal structure, periodicity, lattice and basis, Unit cell and Primitive cell, wigner Seitz primitive cell, symmetry operations for 2-D crystals, Bravis lattices in 2-D and 3-D. Unit 2 : Crystal Planes and Miller indices, interplanar spacing, crystal structure of ZnS, NaCl and Diamond, XRD, Braggs Law and Diffraction methods, K-Space.
Sept2025	Unit 3: Reciprocal Lattice and its physical significance, Reciprocal lattice vector, reciprocal lattice to Simple cubic, b. c. c and f. c. c. Specific heats of solids, Einstein theory of specific heat, Debye model of Specific heats of solids. UNIT-I : Failure of E.M. Theory. Quantum theory of radiation (old quantum theory), Photon, Photoelectric effect and Einstein's photoelectric equation, Compton effect. Inadequacy of old quantum theory, de-Broglie hypothesis. Davisson and Germer experiment. G.P. Thomson experiment. Phase velocity, group velocity, Heisenberg's uncertainty principle. Time-energy and angular momentum, position uncertainty principle from de-Broglie wave, Gamma Ray Microscope, Electron diffraction from a slit.
Oct2025	UNIT-II : 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. Solution of Schrodinger equation for harmonic oscillator ground states and excited states.
Nov2025	UNIT-III : 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). (i) One-dimensional potential barrier $E > V_0$ (Reflection and Transmission coefficient). (ii) One-dimensional potential barrier $E < V_0$ (Reflection Coefficient, penetration of leakage coefficient, penetration depth).

