Lesson Plan

Name of the Assistant Professor: Suman Lata
Class and Semester: B.Sc. I (1st Sem)
Subject: Physics (Mechanics)
Session: 2025-26

Months	Topics
July & August	Unit-I: Fundamentals of Dynamics: Rigid Body, Moment of Inertia, Radius of Gyration, Theorems of Perpendicular and Parallel Axis, M.I. of ring,disc, Angular Disc, Solid cylinder, Solid Sphere, Hollow Sphere, Rectangular plate, Square Plate, Solid cone, Triangular Plate, Torque, Rotational Kinetic Energy, Angular Momentum, Law of conservation of angular momentum, Rolling Motion, Acceleration of a body rolling down an inclined plane, Fly wheel, M.I. of an irregular body
September	Unit-II: Elasticity: Deforming force, Elastic limit, Stress, strain, Hooks law, Modulus of Rigidity, Poisson ratio and its limiting value, Elastic constants and their relations, Torque required for twisting cylinder, Bending of beams, Bending moment and its magnitude, Bending of cantilever, weight of cantilever uniformly distributed over its entire length. Dispersion of a centrally loaded beam supported at its ends, Determination of elastic constants by Searle' method.
October	Unit-III: Special Theory of Relativity Reference system, internal and non- internal frames, Galilean invariance laws, Newtonian Relativity Principle, Michelson- Morley experiment search for ether. Lorentz transformations. Length Contraction, Lime dilation, Twin paradox, Velocity addition theorem. Variation of mass with velocity, Mass energy equivalence. Relativistic Doppler effect, Relativistic Kinematics, Transformation of Energy, momentum & Force, Problems of relativistic dynamics. Unit – IV: Gravitation and central force motion: Law of gravitation, Potential and field due to Spherical shell and solid sphere, Motion of a particle under central force field, Two body problem and its Reduction to one body problem, Compound pendulum and expression of time period, Determination of g by bar pendulum, Normal modes of vibration for spring mass system
November	Revision.

Suman
Signature of Teacher

Lesson Plan

Name of the Assistant Professor Suman Lata
Class and Semester : B.Sc. II (3rd Sem.)
Subject: Physics (Computer Programming and Optics)
Session: 2025-26

Months	Topics
July & August	Unit-1: Computer Programming Computer organization, binary representation, algorithm, flowchart, FORTRAN preliminaries, executable & non- executable, input and output statements, formats, IF, DO and GO TO statements, Dimension arrays, statement function and function subprogram. Unit-2: Applications of FORTRAN programming Algorithm, flow chart and programming for print out of natural numbers, range of given numbers, ascending and descending order, mean standard deviation least square fitting of curve, roots of quadratic equation, product of matrices, numerical integration.
September	Unit-3: Interference I Interference by division of wave front: Young's double slit experiment, coherence, conditions of interference, Fresnel's biprism and its applications to determine wavelength of sodium light and thickness of a mica sheet, Lloyd's mirror, Difference between Bi-pirsm and Llyod mirror fringes, phase change on reflection. Interference II Interference by division of amplitude: plane parallel thin film, production of colours in thin films, classification of fringes in films, wedge shaped film, Newton's rings. Interferometers: Michelson's interferometer and its application to (i) Standardization of a meter (ii) determination of wavelength.
October	Unit-4: Diffraction I Fresnel's diffraction: Fresnel's assumptions and half-period zones methods, diffraction at a straight edge, rectangular slit and circular aperture, diffraction due to a narrow slit and wire. Diffraction II Fraunhofer diffraction: Single-slit diffraction, double slit diffraction, N-slit diffraction, plane transmission granting spectrum, dispersive power of granting, limit of resolution. Rayleigh's criterion, resolving power of telescope and a granting. Difference between prism and granting spectra.
November	Revision

Suman
Signature of Teacher

Lesson Plan

Name of the Assistant Professor: Ms. Suman Lata
Name of the Department: Physics
Class: B.Sc-III (Sem 5th)
Session: 2025-26
Subject: Nuclear Physics

Months	Topics
July & August	Unit 1 Nuclear mass and binding energy, systematics nuclear binding energy, nuclear stability, Nuclear size, spin, parity, statistics magnetic dipole moment, quadrupole moment (shape concept), Determination of mass by Bain-Bridge, Bain-Bride and Jordan mass spectrograph, Determination of charge by Mosley law Determination of size of nuclei by Rutherford Back Scattering.
September	Unit 2 Interaction of heavy charged particles (Alpha particles), alpha disintegration and its theory Energy loss of heavy charged particles (idea of Bethe formula, no derivation), Energetics of alpha -decay, Range and straggling of alpha particles. Geiger-Nuttal law. Introduction of light charged particles (Beta-particle), Origin of continuous beta-spectrum (neutrino hypothesis) types of beta decay and energetics of beta decay, Energy loss of beta- particles (ionization), Range of electrons, absorption of beta-particles. Interaction of Gamma Ray, Nature of gamma rays, Energetics of gamma rays, passage of Gamma radiations through matter (photoelectric, Compton and pair production effect) electron position annihilation. Absorption of Gamma rays (Mass attenuation coefficient) and its application.
October	Unit 3 Nuclear reactions, Elastic scattering, Inelastic scatting, Nuclear disintegration, photoneclear reaction, Radiative capture, Direct reaction, heavy ion reactions and spallation Reactions, conservation laws. Q-value and reaction threshold. Nuclear Reactors General aspects of Reactor design. Nuclear fission and fusion reactors (Principles, construction, working and use) Unit 4 Linear accelerator, Tendem accelerator, Cyclotron and Betatron accelerators. Ionization chamber, proportional counter, G.M. counter detailed study, scintillation counter and semiconductor detector.
November	Revision

Suman
Signature of Teacher

Lesson Plan

Name of the Assistant: Suman Lata
Class and Semester: B.Sc. III (5th)
Subject: Quantum And Laser Physics
Session: 2025-26

Months	Topics
July & August	Unit 1: Origin quantum physics (Experimental basis) Origin quantum physics (Experimental basis) Overview, Scale of quantum physics, boundary between classical and quantum phenomena. photon, Photoelectric effect, Compton effect (theory and result). G.P. Thomson experiment, Phase velocity, group velocity and their relation. Heisenberg's uncertainty principle. Time energy and angular momentum, position uncertainty. Uncertainty principle from de Broglie wave, (wave-particle duality). Gamma Ray Microscope, Electron diffraction from a slit. Derivation of 1-D time dependent Schrodinger wave equation (Subject to force free particle). Time independent Schrodinger wave equation, Eigen values, eigen function. wave functions and its significance. Orthogonality and Normalization of function, concept of observer and operator. Expectation value of dynamical quantities, probability current density
September	Unit-2 : Application of Schrodinger wave equation: (1) Free Particle in one-dimensional box (solution of Schrodinger wave equation, eigen function, eigen values, quantization of energy and momentum, nodes and anti nodes, zero point energy). (2) One dimensional step potential E>Vo (Reflection and Transmission coefficient) (3) One dimensional step potential E<Vo (Reflection and Transmission coefficient) (4) One dimensional step barrier, E>Vo (Reflection and Transmission coefficient) (5) Solution of Schrodinger equation for harmonic oscillator (quantization of energy point energy, wave equation for ground state and excited states.)
October	Unit-3: Laser Physis-1 Absorption and emission of radiation, Main features of a laser; Directionality, high intensity high degree of coherence, spatial and temporal coherence, Einstein's coefficients and possibility of amplification, momentum transfer, life time of a level, kinetics of optical absorption (two and three level rate landerburg formula). population inversion; A necessary condition for light amplification, resonance cavity, laser pumping Threshold condition for laser emission, line broadening mechanism, homogeneous and inhomogeneous line broadening (natural, collision and Doppler broadening). Unit-4 : Ruby laser, He-Ne laser, semiconductor laser, Applications
November	Revision

Suman
Signature of Teacher

Lesson Plan

Name of Assistant Professor: Suman Lata
Class & Semester: BA II (MDC) 3rd Sem
Subject: Physics
Session: 2025-26

Month	Topics
July & August	Unit-I Vector Background and Electric Field: Gradient of a scalar and its physical significance, Line, Surface and Volume integral of a vector and their physical significance, Flux of a vector field, divergence and curl, Gauss divergence theorem and Stoke's theorem. Derivation of electric field E from potential as gradient, Electric flux, Gauss's Law, Mechanical force of charged surface.
September	Unit-II Basic Concepts of Electrostatics: Electric charge, Coulomb's law, Electric field, Electric field of a point charge, Electric potential, Electric potential of a point charge. Dielectric, Capacitor and Capacitance, A dielectric or dielectric material, Dielectric polarization, Electric dipole moment (SI unit), Permittivity, Static dielectric constant, Capacitor and capacitance, Potential energy stored in a capacitor, Capacitance of a parallel plate capacitor, SI unit of capacitance, Relation between the dielectric constant and the capacitance of a dielectric.
October	Unit-Ill Electrical Conductor: A conductor, Electric current, Resistance and conductance of a conductor and their units, Characteristics of good electrical conductor with examples, Ohm's law, Direct current and its sources, alternating current and its sources, Uses in electrical/ electronic circuits. Magneto-statics: Biot Savert law, Magnetic field and its SI unit, Magnetic flux and force, Ampere's circuital law.
November	Revision

Suman
Signature of Teacher