Lesson Plan
Session: 2025-26

Name of the Assistant Professor: Amandeep Singh

Class: B.Sc. 1st semester **Subject:** PHYSICS

Paper : BSC/PHY/MD/1/DSC/105–Mechanics and Theory of Relativity

Credit: 3

Dates	Week	Topic
24/07/2025 to 26/07/2025	**1**	**Unit 1:Rotational dynamics** Introduction, Rigid body, Moment of Inertia, Radius of Gyration, Torque, Angular momentum
28/07/2025 to 02/08/2025	**2**	Rotational kinetic energy, law of conservation of angular momentum, theorem of perpendicular and parallel axis
04/08/2025 to 09/08/2025	**3**	Moment of Inertia of Ring, Disc, solid cylinder, hollow cylinder, solid sphere, hollow sphere, Spherical Shell, solid bar of rectangular cross section
11/08/2025 to 16/08/2025	**4**	Moment of Inertia of Fly wheel, Moment of inertia of an irregular body, acceleration of a body rolling down on an inclined plane.
18/08/2025 to 23/08/2025	**5**	Numerical problems and doubts
25/08/2025 to 30/08/2025	**6**	**UNIT 2: Elasticity** Elasticity, Stress and Strain, Hook's Law, Elastic constants and their relations, Poisson's ratio,
01/09/2025 to 06/09/2025	**7**	Torsion of cylinder and twisting couple, Determination of Coefficients of modulus of rigidity for the material of wire by Maxwell's needle
08/09/2025 to 13/09/2025	**8**	Bending of beam (bending moment and its magnitudes), Cantilever and centrally loaded beam

Dates	Week	Topic
15/09/2025 to 20/09/2025	**9**	Determination of Young's modulus for the material of the beam and Elastic constants for the material of the wire by Searle's method.
22/09/2025 to 27/09/2025	**10**	Numerical problems and doubts
29/09/2025 to 04/10/2025	**11**	**Unit 3: Theory of Relativity** Reference frames, Inertial and non-Inertial frames of references, Galilean Transformation
06/10/2025 to 11/10/2025	**12**	Galilean Invariance and principle of Newtonian relativity, Michelson-Morley's experiment and its findings
13/10/2025 to 18/10/2025	**13**	**MID TERM EXAM**
27/10/2025 to 01/11/2025	**14**	Postulates of special theory of relativity, Lorentz Transformations,
03/11/2025 to 08/11/2025	**15**	Length contraction, Time Dilation and Twin Paradox velocity addition theorem
10/11/2025 to 15/11/2025	**16**	Variation of mass with velocity, Mass Energy equivalence
17/11/2025 to 24/11/2025	**17**	Numerical Problems and doubts

Signature

Lesson Plan
Session: 2025-26

Name of the Assistant Professor: Amandeep Singh

Class: B.Sc. 3rd semester **Subject:** PHYSICS

Paper : BSC/PHY/MD/3/DSC/201:Wave Optics **Credit**: 3

Dates	Week	Topic
24/07/2025 to 26/07/2025	**1**	**Unit 1 Interference:** Young's double slit experiment, Coherent sources, Conditions of interference
28/07/2025 to 02/08/2025	**2**	Fresnel's biprism and its applications to determine the wavelength of sodium light and thickness of a mica sheet, phase change on reflection
04/08/2025 to 09/08/2025	**3**	Plane parallel thin film, production of colours in thin films Interference due to transmitted light and reflected light
11/08/2025 to 16/08/2025	**4**	wedge shaped film, Newton's rings and its applications.
18/08/2025 to 23/08/2025	**5**	Numerical problems of unit I
25/08/2025 to 30/08/2025	**6**	**UNIT 2: Fresnel Diffraction:** introduction of diffraction, Fresnel's half period zones, zone plate
01/09/2025 to 06/09/2025	**7**	diffraction at a straight edge, diffraction at rectangular slit
08/09/2025 to 13/09/2025	**8**	**Fraunhoffer diffraction:**single slit diffraction, double slit diffraction

Dates	Week	Topic
15/09/2025 to 20/09/2025	**9**	Plane Diffraction grating, limit of resolution
22/09/2025 to 27/09/2025	**10**	Rayleigh's criterion, resolving power of telescope and a grating.
29/09/2025 to 04/10/2025	**11**	**UNIT 3: Polarization**: Polarisation by reflection, refraction and scattering, Malus Law
06/10/2025 to 11/10/2025	**12**	Phenomenon of double refraction, Huygens's wave theory of double refraction
13/10/2025 to 18/10/2025	**13**	**MID TERM EXAM**
27/10/2025 to 01/11/2025	**14**	Nicol prism, Quarter wave plate and half wave plate
03/11/2025 to 08/11/2025	**15**	Production and detection of (i)Plane polarized light (ii)Circularly polarized light and (iii)Elliptically polarized light,
10/11/2025 to 15/11/2025	**16**	Optical activity, Fresnel's theory of optical rotation, Specific rotation
17/11/2025 to 24/11/2025	**17**	Problems and doubts

Signature

Lesson Plan
Session: 2025-26

Name of the Assistant Professor: Amandeep Singh

Class: B.Sc. 5th semester **Subject:** PHYSICS

Paper: Quantum Mechanics

Dates	Week	Topics
24/07/2025 to 26/07/2025	**1**	**Unit-1** :introduction, Scale of Quantum physics, Boundary between classical and quantum phenomena, Photoelectric effect , Compton effect, Frank Hertz expt,
28/07/2025 to 02/08/2025	**2**	de Broglie Hypothesis, Devision and Germer expt , G P thomson expt Phase velocity and group velocity and their relation Heisenberg uncertainity principle , time energy and angular momentum Uncertainity principle from de broglie wave
04/08/2025 to 09/08/2025	**3**	Gamma ray microscope , electron diffraction from a slit Derivation of 1D time dependent SWE Time independent SWE , eigen value and eigen function Orthogonality and normalization of a function Expectation value of a dynamical quantities , probability current density
11/08/2025 to 16/08/2025	**4**	**Unit -2:** Free particle in 1D box , eigen function and eigen values Quantization of energy and momentum , nodes and anti nodes Zero point energy 1D step potential E>Vo , 1D step potential E<Vo 1D potential barrier E>Vo 1D potential barrier E<Vo
18/08/2025 to 23/08/2025	**5**	Solution of SWE for Harmonic oscillator. Wave equation for ground state and excited state, doubts and problems
25/08/2025 to 30/08/2025	**6**	**Unit-3** Absorption and emission of radiation Main features of a laser , directionality High intensity , high degree of coherence Spatial and temporal coherence , Einstien coefficients and possibility of amplification Momentum transfer Life time of level Kinetics of optical absorption
01/09/2025 to 06/09/2025	**7**	Population inversion, Resonance cavity , laser pumping Threshold condition for laser emission , Line broadening mechanism Homogeneous broadening , Inhomogeneous line broadening
08/09/2025 to 13/09/2025	**8**	**Unit -4** Ruby laser , He-Ne laser Optical properties of semiconductors , Semiconductor laser ,Applications of laser **ASSIGNMENT**

Paper 2: Nuclear Physics

Dates	Week	Topic
15/09/2025 to 20/09/2025	**9**	**Unit 1:** introduction, Nuclear composition, Nuclear properties Nuclear size, spin, parity, statistics. Magnetic dipole moment, quadrupole moment (shape concept). Mass and binding energy, Systematics of nuclear binding energy, nuclear stability.
22/09/2025 to 27/09/2025	**10**	Determination of mass by Bain-Bridge, Bain-Bridge and Jordan mass spectrograph. Determination of charge by Mosley Law. Determination of size of nucleus by Rutherford Back Scattering. Numerical problems Discussions of questions and doubt
29/09/2025 to 04/10/2025	**11**	**Unit-2:** Alpha-disintegration and its theory. Energetics of alpha-decay, Origin of continuous beta spectrum (neutrino hypothesis). Type of beta decay and energetics of beta decay. Nature of gamma rays. Energetics of gamma rays. Interaction of heavy charged-particles (Alpha particles): Energy loss of heavy charged particle (idea of Bethe formula, no derivation).
06/10/2025 to 11/10/2025	**12**	Range and straggling of alpha particles. Geiger-Nuttal law. Numerical problems Interaction of light charged particle (Beta-particle). Energy loss of beta particles (ionization). Range of electrons, absorption of beta particles. Interaction of Gamma sRay: passage of Gamma radiations through matter, Photoelectric Effect, Compton effect.
13/10/2025 to 18/10/2025	**13**	Pair Production, Electron Positron annihilation. Absorption of Gamma rays: Mass attenuation cofficient and its application. Numerical Problems. Discussions of questions and doubts. **MID TERM EXAM** .
27/10/2025 to 01/11/2025	**14**	**Unit-3:** Linear accelerator. Tendem accelerators Cyclotron and Betatron accelerators. Ionization chamber, proportional counter, G.M counter (detailed study).
03/11/2025 to 08/11/2025	**15**	Scintillation counter and semicounductor detector. Numerical Problems and Discussions of questions and doubt. **Unit-4:** Nuclear reactions, Elastic scattering, Inelastic scattering. Nuclear disintegration, photo-nuclear reaction.Radiative capture Direct-reaction.
10/11/2025 to 15/11/2025	**16**	Heavy ion reactions and spallation reactions. Conservation laws, Q-value and reaction Threshold. Nuclear Reactors, General aspects of Reactor Design.
17/11/2025 to 24/11/2025	**17**	Nuclear fission reactors. Nuclear Fusion reactors. Numerical problems. Discussions of questions and doubts.