Lesson Plan of July to November

Name of Assistant Professor: Dr. Naveen Kumari

Class: B.Sc. 1stsemester

Course-1 (DSC-1): Mechanics and Theory of Relativity (Theory)

Month	Topic
July	Unit -I Mechanics of single and system of particles, Conservation law of linear momentum, Angular momentum and mechanical energy for a particle and a system of particles,Centre of Mass and equation of motion, Constrained Motion. **Presentation Revision and Test**
August	Work and Kinetic Energy Theorem.Conservative and Non conservative forces.Potential Energy.Energy diagram.Stable and unstable equilibrium. Elastic potential energy. Force as gradient of potential energy.Work & Potential energy.Work done by non-conservative forces. Law of conservation of Energy. **Presentation Revision and Test**
September	Generalized Notations: Degrees of freedom and Generalized coordinates,Transformation equations,Generalized Displacement, Velocity, Acceleration, Momentum, Force and Potential, Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems. Hamilton's variational principle, Lagrange's equation of motion from Hamilton'sprinciple, Linear Harmonic oscillator, Simple pendulum, Atwood's machine **Presentation Revision and Test**
October	Unit-III Rotational Dynamics: Rotation of Rigid body,moment of inertia, torque, angular momentum, kinetic energy of rotation. Theorems of perpendicular and parallel axes with proof. Moment of inertia of solid sphere, hollow sphere, spherical shell, solid cylinder, hollow cylinder and solid bar of rectangular cross-section. Acceleration of a body rolling down on an inclined plane. Kinetic energy of rotation. Motion involving both translation and rotation. **Presentation Revision and Test**
November	Unit 4 Special Theory of Relativity: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of Physics in rotating coordinate systems.Centrifugal force.Coriolis force and its applications. Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz

	contraction.Time dilation.Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity.Massless Particles.Mass-energy Equivalence. Relativistic Doppler effect.Relativistic Kinematics. Transformation of Energy and Momentum. Energy-Momentum Four Vector. **Presentation Revision and Test**

Lesson Plan of July to November

Name of Assistant Professor :Dr. Rohit Kumar
Class: B.Sc.3rd semester
Subject: B.Sc. (Physical Sciences) Optics

Month	Topic
July	**Unit I**
	INTERFERENCE: Interference by Division of Wave front: Young's double slit experiment, Coherence, Conditions of interference, Fresnel's biprism and its applications to determine the wavelength of sodium light and thickness of a mica sheet, phase change on reflection. **Presentation Revision and Test**
August	Interference by Division of Amplitude:Plane parallel thin film, production of colours in thin films, classification of fringes in films,Interference due to transmitted light and reflected light, wedge shaped film, Newton's rings **Unit–II** DIFFRACTION Fresnel's diffraction: Huygens-Fresnel's theory, Fresnel's assumptions,rectilinear propagation of light, diffraction at a straight edge, rectangular slit and diffraction at a circular aperture. **Presentation Revision and Test**

September	Fraunhoffer diffraction: Single slit diffraction, double slit diffraction,plane transmission grating spectrum,dispersive power of grating, limit of resolution, Rayleigh's criterion, resolving power of telescope and a grating. **Presentation Revision and Test**
October	**Unit–III** POLARIZATION: Polarisation by reflection, refraction and scattering, Malus Law, Phenomenon of double refraction, Huygens's wave theory of double refraction (Normal and oblique incidence),Analysis of polarized Light.Nicol prism, Quarter wave plate and half wave plate, production and detection of (i) Plane polarized light (ii) Circularly polarized light and (iii) Elliptically polarized light. Optical activity, Fresnel's theory of optical rotation, Specific rotation, Polarimeters (half shade and Biquartz) **Presentation Revision and Test**
November	**Unit–IV**
	population inversion; Main components of lasers: (i) Active Medium (ii)Pumping (iii)Optical Resonator; Properties of laser beam: Monochromaticity, Directionality, Intensity, Coherence (Spatial & Temporal coherence); Metastable state, Excitation mechanism and Types of Lasers (He-Ne Laser & Ruby Laser), Applications of Lasers. FIBRE OPTICS:Optical fibres and their properties, Principal of light propagation through a optical fibre, Acceptance angle and numerical aperture, Types of optical fibres: Single mode and multimode fibres, Advantages and Disadvantages of optical fibres **Presentation Revision and Test**

Lesson Plan of July to November

Name of Assistant Professor: Dr. Naveen Kumari

Class : B.Sc.5th semester

Subject: Solid State Physics

Month	Topic
July	Crystalline and glassy forms, liquid crystals. Crystal structure, periodicity, lattice and basis, crystal translational vectors and axes, **Presentation Revision and Test**
August	Unit cell and primitive cell, Winger Seitz primitive Cell, symmetry operations for a two-dimensional crystal, Bravais lattices in two and three dimensions, crystal planes and Miller indices, Interplanar spacing, Crystal structures of Zinc sulphide, Sodium Chloride and diamond **Presentation Revision and Test**
September	Reciprocal lattice and its physical significance, reciprocal lattice vectors, reciprocal lattice to a simple cubic lattice, body centred cubic lattice and face centred cubic lattice; **Presentation Revision and Test**
October	X-ray diffraction, Bragg's Law and experimental x-ray diffraction methods; Specific heat: Specific heat of solids, Einstein's theory of specific heat, Debye model of specific heat of solids. **Presentation Revision and Test**
November	**Presentation Revision and Test**

Lesson Plan of July to November

Name of Assistant Professor: Dr. Naveen Kumari

Class : B.Sc. 5th semester

Subject: Quantum Mechanics

Month	Topic
July	**UNIT 1:** Failure of E.M Theory, Old Quantum Theory, Photon, Photoelectric effect and Einstein Photoelectric equation Compton effect, De-Broglie hypothesis, Davisson and Germer experiment
August	G.P. thomson experiment, Phase velocity and Group velocity Heisenberg's Uncertainty principle, Time-energy and angular momentum, position uncertainty , Gamma-ray microscope, Electron Diffraction from a slit **Presentation Revision and Test** **Unit 2** Derivation of time dependent schrodinger wave equation, Eigenvalues and Eigenfunctions Wave functions and its significance, Normalization wave function ,
September	Concept of observable and operator , Solution of Schrodinger equation for harmonic oscillator ground states and excited states **Presentation Revision and Test** **Unit 3** Quantization of energy and momentum, nodes and antinodes, Zero point energy **Presentation Revision and Test**

October	1-D potential barrier E greater than V (Reflection and Transmission Coefficient) 1-D potential barrier E less than V (Reflection and Transmission Coefficient) **Presentation Revision and Test**
November	**Presentation Revision and Test**