G.C. Dujana, Jhajjar
Lesson Plan (Aug 2025 to December 2025)

Dr. Monica
Semester III
Subject: Physics (Optics) 25PHYM403DS01

	Week 1	Week 2	Week 3	Week 4/Week 5
AUG	Introduction to paper Introduction to interference, Interference by division of wavefront	Young double slit experiment, Numericals Fresnel's biprism and its applications phase change on reflection.	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
SEP	Huygens-Fresnel's theory, Fresnel's assumptions, rectilinear propagation of light, diffraction at a straight edge, rectangular slit and at a circular aperture.	Fraunhoffer diffraction: Single slit double slit diffraction, plane transmission grating spectrum,	Dispersive power of grating limit of resolution, Rayleigh's criterion, resolving power of telescope and a grating.	Polarisation by reflection, refraction and scattering, Malus Law, Double refraction, Huygens's wave theory of double refraction
OCT	Analysis of polarized Light. Nicol prism, Quarter wave plate and half wave plate Optical activity, Fresnel's theory of optical rotation, Specific rotation	Diwali vacations	Polarimeters LASERS: Basic concept of absorption and emission of radiations, amplification and population inversion;	Main components of lasers Properties of laser beam: Excitation mechanism and Types of Lasers, Applications of Lasers.
NOV	FIBRE OPTICS: Optical fibres and their properties, Propagation through a optical fibre, Acceptance angle and numerical aperture,	Types of optical fibres Advantages and Disadvantages of optical fibres. Revision	Semester exams	Semester exams

G.C. Dujan, Jhajjar
Lesson Plan
Aug 2025 to December 2025

Class: B.Sc.-III (Pass Course) Semester-V
Subject: Physics (PHY-501 – Solid State Physics)

	Week 1	**Week 2**	**Week 3**	**Week 4/Week 5**
AUG	Crystalline and glassy forms, Liquid Crystals, Crystal Structure, Translation Vector, Lattice parameters,	Wigner – Seitz primitive Cell Crystal Symmetry, Bravais lattice in 2- D, Bravais Lattice in 3-D	Crystal planes and Miller indices, Interplanar Spacing	Crystal Structures (sc, bcc, fcc, hcp) NaCl, CsCl, Diamond, ZnS Structure, Numerical problems
SEP	X Ray Diffraction, Bragg's law, Experimental X ray diffraction methods	Unit 2: Test, Reciprocal Lattice and lattice vectors	Physical Significance of Reciprocal Lattice (geometrical interpretation, vector form of Bragg's law)	Atomic Scattering factor , Reciprocal lattice Of SCC, FCC, BCC; K space
OCT	Assignment, Specific heat of solids, Heat capacity Dulong and Petit's Law,	Diwali vacations	Einstein Theory of Specific heat of solids Einstein Theory of Specific heat of solids ,	Debye Theory of lattice Specific Heats, Approximation and Special cases of Debye theory
NOV	Shortcomings of Debye Model, Assignment and Revision	Revision and Tests	Semester Exams	

Semester V
Paper 2 - Quantum Mechanics PHY-502

	Week 1	**Week 2**	**Week 3**	**Week 4/Week 5**
AUG	Failure of E.M. Theory. quantum theory of radiation,photoelectric effect and Photoelectric equation compton effect Inadequancy of old quantum theory, de-Broglie hypothesis.	Davisson and Germer experiment. G.P. Thomson experiment Phase velocity roup velocity, Heisenberg's uncertainty principle.	Time-energy and angular momentum Position uncertainty Uncertainty principle from de-Broglie wave,	Gamma Ray Microscope, Electron diffraction from a slit Derivation of time dependent Schrodinger wave equation,
SEP	Eigen values, eigen functions, wave functions and its significance. Normalization of wave function, concept of observable and operator.	Solution of Schrodinger equation Time dependent Schrodinger wave equation, eigen values, eigen functions, wave Normalization of wave function	Harmomic Oscillator	Energy and Wave solution Operators, Expectation Value
OCT	Application of Schrodinger equation in the solution of the following one-dimensional problems	Diwali Break	One-dimensional potential barrier, E>V0	Free particle in one dimensional box i) One-dimensional potential barrie E>V0
NOV	ii) One-dimensional potential barrier, $E>V_0$ Reflection Coefficient, penetration of leakage coefficient, penetration depth $E>V_0$	Revision	Semester Exams	

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Lesson Plan (July 2025 to December 2025)

Semester I Physics
Subject: Mechanics and Theory of Relativity 24PHYM401DS01

	Week 1	**Week 2**	**Week 3**	**Week 4/Week 5**
July	Admissions	Admissions	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. Work and Kinetic Energy Theorem. Conservative and non conservative forces. Potential Energy. Energy diagram.
AUG	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 Problems	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.
SEP	Hamilton's variational principle, Lagrange's equation of motion from Hamilton's principle,	Linear Harmonic oscillator, Simple pendulum, Atwood's machine. Rotational Dynamics: Rotation of Rigid body,	Moment of inertia, torque, angular momentum, kinetic energy of rotation. Theorems of perpendicular and parallel axes.	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.
OCT	Special Theory of Relativity: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of Physics in rotating systems.	Diwali vacations	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.
NOV	Variation of mass with velocity. Mass-energy Equivalence. Relativistic Doppler effect.	Relativistic Kinematics. Transformation Energy and Momentum. Energy-Momentum Four Vector.	Revision/ Semester exams	Semester exams