Lesson Plan (2025-2026)

Name: Ms Komal and Ms. Ritu Malik
COURSE ID: 240/PHYP/MI102

Class: Minor Course, 1st sem Subject: PHYSICS-I

July 16th onwards	**Unit -1** **Relativity: Inadequacy of Galilean Transformations, Michelson-Morley experiment, Postulates of Special relativity, Lorentz transformation, Time dilation, length contraction, twin paradox, velocity transformation and its applicationUnit Test 1**
August	**Unit -2 Relativistic energy and momentum, Mass-energy equivalence, Four vectors (elementary discussion), Doppler Effect for light, Gravity and light, Principal of equivalence, Spacetime: timelike and spacelike intervals, Introductory idea of general theory of relativity (no derivation)**.Doubt session
September	**Unit -3** **Particle Properties of Waves: Electromagnetic waves, Blackbody radiation, Planck's radiation formula, Quantum nature of light, Photoelectric effect. X-rays, X-rays spectra,**
October **Sem break** **(18-10-25 to 26-10-25)**	**X-ray diffraction, Compton effect, Pair production, Photon absorption, Photons and gravity, gravitational red shift. Unit -4 Wave properties of particles: De Broglie Matter waves. Class discussion**
November	**Waves of probability, characteristics of general waves, phase and group velocities, diffraction from particles- Davisson-Germer experiment, Particle in a box (No derivation), Uncertainty principle and its applications and revision**

Lesson Plan (2025-2026)

Name: Dr. Meena Yadav

Paper Code: 240/PHYP/MD102

Class: MDC

Subject: Rational Thinking and Science

July 16th onwards	**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. **Assignments**
August	**Unit-1** myth-busting discoveries in physics: 1) Heliocentrism (Copernicus, Galileo), 2) Gravity and motion (Newton), 3) Theory of relativity (Einstein), 4) Nature of lightning (Benjamin Franklin), 5) Vacuum and air pressure (Evangelista Torricelli, Otto von Guericke) **Assignments.**
September	**Unit-2** 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. **MID TERM TEST**
October **Sem break** **(18-10-25 to 26-10-25)**	**Unit-3** The Paradox of Science & Technology: Distinction between science and technology, understanding the science-technology acceptance paradox, case studies: 1) acceptance and rejection of new technologies, 2) rejection and resistance to scientific ideas, the future of Artificial Intelligence (AI) and its societal acceptance, potential problems in AI
November	**Unit-4** 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. **FULL SYLLABUS TEST**

Lesson Plan (2025-2026)

Name: Dr. Meena Yadav, Ritu Malik Paper Code: 240/PHY/CC-A1

Class: B.Sc. 1st Year(NM) Subject: Mechanics

July 16th onwards	**Unit -1** Time derivative of a vector, Motion in Plane Polar coordinates, Newton's Law, Mechanics of single and system of particles.
August	**Unit-1** Conservation of laws of linear momentum, angular momentum and mechanical energy, Central forces, fictitious forces, Centrifugal force, Coriolis force and its applications. **Assignments**
September	**Unit-2** Centre of mass and equation of motion, Constrained motion, degrees of freedom, Generalised coordinates, 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. **MID TERM TEST**
October **Sem break (18-10-25 to 26-10-25)**	**Unit-3** 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. **Assignments**
November	**Unit-4** 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. **FULL SYLLABUS TEST**

Lesson Plan (2025-2026)

Name: Dr. Geetanjali

Paper Code: 240/PHYP/SE101

Class: B.Sc.-I, Sem 1st

Subject: Basics of Instrumentation skills

July 16th onwards	**Unit -1** Basic of Measurement: Instruments accuracy, precision, sensitivity, Resolution range, etc. Errors in measurements and loading effects, Random and systematic errors, Error propagation
August	Multimeter: Principles of measurement of DC voltage and DC current, AC voltage, AC current and resistance. Specifications of a multimeter and their significance. **Unit-2** Electronic Voltmeter and their Advantage for voltage measurement w.r.t. input impedance and sensitivity, Principles of current & voltage measurement, Electronic Voltmeter/Multimeter and their significance.
September	**Unit-3** Oscilloscope: Block diagram of basic CRO, CRT, electrostatic focusing and acceleration (Explanation only– no mathematical treatment), brief discussion on screen phosphor, visual persistence, Time base operation, synchronization, Front panel controls, Specifications of CRO and their significance, Use for the measurement of voltage (dc and ac), frequency and time period. **Mid-term Test**
October **Sem break (18-10-25 to 26-10-25)**	**Unit -4** Impedance Bridges and Q-meters: Block diagram of bridge, Working principles of basic (balancing type) RLC bridge. Specifications of RLC bridge, Block diagram and working principles of a Q- Meter.
November	Digital Instruments: Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles and block diagram of digital voltmeter.

Lesson Plan (2025-2026)

Name: Dr. Smriti Sharma, Dr. Meena, Ms.Ritu Malik, Dr. Himanshi

COURSE ID: UG-VAC-1-1

Class: VAC Subject: Human Values and Ethics

July 16th onwards	Human Values: Definition and types of values: personal, social and cultural, Core Values. *Presenfafion by students*
August	social and cultural, Core Values *Presenfafion by students*
September	**ETHICS -Definition, Ethics vs. Values, Importance of Ethics, The role of ethics in society, Integrity: Meaning and its role in personal life.** ***Test***
October **Sem break** **(18-10-25 to 26-10-25)**	Ethical Dilemma: Meaning and nature, common ethical dilemmas, ethical decision making: meaning and steps in ethical decision making: identifying the problem, considering options, evaluating consequences, making a decision
November	Challenges for ethical practices in institutions: **Ragging, suicide and need for educational counseling, violence and peaceful protest, conflict resolution.** **Revision**

Lesson Plan (2025-2026)

Name: Dr. Meena, Dr. Abhilasha and Dr. Himanshi

Class: B.Sc. Physical science

Subject : WAVES AND OPTICS (Semester-III) Course ID - 240/PHYP/CC301

July 16th onwards	**Unit–I: Waves** • Define oscillatory motion and SHM with examples. • Derive wave equation and explain its solution.
August	• Differentiate between transverse and longitudinal waves. • Explain stationary waves and their conditions of formation. • Distinguish between phase and group velocity. • Interpret light as a transverse wave. **Assessment:** • Short quiz on wave equation and SHM. • Numerical problems on frequency and velocity of waves.
September	• **Unit–II: Interference** • Demonstrate interference of light and state its conditions. • Explain YDSE and Fresnel biprism experiments. • Relate interference in thin films to colours seen in soap bubbles. Explain Newton's rings and determine wavelength, Differentiate Fresnel and Fraunhofer diffraction. **Assessment:** • Written test on YDSE and interference conditions. • Lab performance: measurement using Fresnel's biprism or Newton's rings. • Group discussion: "Why do oil films show colourful patterns?" • **Unit–III: Diffraction** • Drive single slit diffraction pattern and explain central maximum. • Explain working of a diffraction grating. • Apply Rayleigh's criterion to resolution of optical instruments. • Short answer quiz: "Why does diffraction increase when aperture is small?" • Lab experiment report on diffraction grating.
October Sem break (18-10-25 to 26-	• Problem sheet on resolving power. Define polarisation and demonstrate its methods. • Apply Malus law to predict intensity variations.

10-25)	• . **Teaching Strategies & Activities:** • **Demonstration:** Polarisation of light using Polaroid sheets. • **Lab experiment:** Polarimeter to measure specific rotation. • **Activity:** Use sunglasses to explain polarisation in daily life. **Unit–IV: Polarisation** • Explain double refraction using Huygens wave theory.
November	• Use wave plates to produce circular and elliptical polarised light. • Describe optical rotation and its measurement using a polarimeter. **Numerical practice:** Malus law intensity problems. **Assessment:** • Oral viva on polarisation and optical activity. • Lab record: Polarimeter readings. • Written assignment: Applications of polarisation (3D glasses, stress analysis).

Name: Dr. Meena and Dr. Abhilasha

Multidisciplinary Course Course ID – 240/PHYP/MD301

Subject: Our Universe (3rd semester)

July 16th onwards	**Unit I: The Universe and Human Curiosity** • Trace humanity's early attempts to understand the night sky. • Compare geocentric and heliocentric models. • Build a timeline of major scientific discoveries from Galileo to Hubble. • .
August	• Understand the scale and structure of the universe. Appreciate the role of curiosity and imagination in scientific discovery **Evaluation** • Short answer quiz on models of the universe. • Student-made timeline chart. Reflective essay: "Why curiosity drives science.
September	**Unit II: The Big Bang and Cosmic Evolution** **Learning Objectives** • Understand simplified Big Bang theory. • Explain cosmic inflation and ongoing expansion. • Outline formation of matter, stars, galaxies, and planets. • Recognize the roles of dark matter and dark energy (conceptual). Describe the life cycle of stars and formation of elements.

	Evaluation • Worksheet on Big Bang timeline. • Poster presentation on star life cycle. Oral quiz on cosmic expansion and dark matter
October **Sem break** **(18-10-25 to 26-10-25)**	**Unit III: Our Place in the Universe** • Identify planets, moons, and small bodies of the solar system. • Explain Earth's uniqueness for habitability. • Trace history and present of space exploration. • Discuss possibility of extraterrestrial life. • Describe India's Chandrayaan and Mars missions.
November	**Unit IV: Time, Space, and the Quest for Meaning** • Conceptually understand space and time. • Describe Einstein's relativity in simple terms. • Explore black holes and gravitational waves. • Introduce quantum strangeness. • Discuss future of the universe (heat death, multiverse). • Reflect on philosophical and cultural perspectives of cosmology. **Evaluation** • Short notes test (space, time, relativity). • Student presentations on "Fate of the Universe." • Reflective essay: "Cosmic journey and human meaning."

Name: Dr. Himanshi and Dr. Abhilasha COURSE ID: 240/PHYP/MI301

Class: Minor Course, Sem 3rd Subject: PHYSICS-III

July 16th onwards	**Unit -1** **State Physics: Crystalline and amorphous solids, types of bonding in a solid: ionic** **bond, covalent bond, Van der Waals bond, metallic bond,**
August	**kinetic theory of electrons in a metal: collision time, drift velocity and Ohm's law, elementary idea of band formation,** **differentiation between metal, semiconductor and insulators using energy bands, pn-** **junction diode: depletion region, forward and reverse bias.** **Unit test and assignment**
September	**Unit II** **Nuclear Physics and Applications: Nuclear composition, Basic structure of the nucleus:** **Size, atomic weight, and binding energy curve. Introductory liquid drop model and shell** **model (Conceptual Only)** **Mid term exam**
October **Sem break** **(18-10-25 to 26-10-25)**	**Unit III** **Radioactive decay: Half-life, Radioactive series, Alpha decay, Beta decay, Gamma** **decay, Type of nuclear reactions, Nuclear Fission, Nuclear reactors, Nuclear Fusion in**

	stars **Class discussion**
November	**Unit IV** **Particle Physics: Interactions and Particles, Leptons, Hadrons and their conservation** **rules, Quarks Model (elementary discussion), Standard model (elementary discussion)** **Revision**

Lesson Plan (2025-2026)(3rd sem)

Name: Dr. Geetanjali Paper Code: 501

Class: B.Sc. III, Sem 5th Subject: Solid State Physics

July 16th onwards	**Unit -1** Crystalline and glassy forms, liquid crystals, Crystal structure, periodicity, lattice and basis crystal translation vectors and axes, Unit cell and primitive cell, Winger Seitz primitive cell.
August	Symmetry operations for a 2D crystal, Space group and point groups, Bravais lattices in 3D, **Unit-2** Crystal planes and Miller indices. Interplanar spacing, numerical based on miller indices and interplanar spacing.
September	Atomic packing Fractions for cubic and hexagonal systems, Crystal Structure of Sodium Chloride, diamond and Zinc sulphide, Numerical based on Miller Indices and Assignment discussion and viva based on assignment. Unit 1 test. X-Ray diffraction, Braggs Law treatment, numerical based on Braggs law, Experimental X ray diffraction methods: Powder method, Laue method and Rotating Crystal method
October **Sem break (18-10-25 to 26-10-25)**	**Unit-3** K Space, Need of Reciprocal Lattice and its physical significance, reciprocal lattice vectors Construction of Reciprocal Lattice, physical significance of Reciprocal Lattice. Unit 2 test Properties of reciprocal Lattice. Reciprocal lattice to a simple cubic lattice, bcc and fcc
November	Specific heat of solids, Einstein's theory of specific heat. Debye model of specific heat of solids, Unit 3-Test, Revision and doubt classes unit 1, Revision and doubt classes unit 2, Revision and doubt classes unit 3

Name: Ms.Komal **Paper Code: 502**

Class: B.Sc. III, Sem 5th **Subject: Qunatum Mechanics**

July 16th onwards	Introduction to quantum physics, Discussion of Failure of classical EM theory, Quantum theory of radiation(old quantum theory) ,photon ,photoelectric effect, Einsteins photoelectric effect equation
August	Compton effect(theory and result) , inadequacy of old quantum theory , de Broglie hypothesis, Davisson and Germer experiment, G.P .Thomson experiment, phase velocity and group velocity,
September	Heisenberg's uncertainty principle ,time energy and angular momentum angular displacement uncertainty position and momentum uncertainty, uncertainty principle from de boglie wave (wave particle duality) , gamma ray microscope , electron diffraction from a slit. Test of Unit -1 ,Unit -2 derivation of. Time dependent Schrodinger wave equation.
October Sem break (18-10-25 to 26-10-25)	Eigen values, eigen function , wave function and it's significance, normalisation of wave function , concept of observable and operator, solution of Schrodinger equation for harmonic oscillator ground states and excited states. Test of unit -2 Unit-3 :- application of Schrodinger equation in the solution of the 1-D problems:- free particle in 1 -D box (solution of Schrodinger wave equation)
November	Eigen function , Eigen values ,quantization of energy and momentum, nodes and antinodes. Zero point energy) (ii) 1-D potential barrier E>Vo (reflection and transmission coefficient) (iii) 1-D potential barrier E<Vo (reflection and penetration of leakage coefficient, penetration depth) Revision and doubt class