**CURRICULUM PLAN 2024-25 (Odd Semester)**

**Name of Teacher: Prof. Pushpa Bindal**

**B. Sc. (HONS.) PHYSICS, Semester I**

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| **Name of Paper**  | **Allocation of Lectures** | **Month wise schedule followed by the Department** | **Tutorial/Assignment/ Presentation etc.** |
| **PAPER –CORE: Waves and Oscillations** |
| **Unit 1: Simple Harmonic Motion** Differential equation of simple harmonic oscillator, its solution and characteristics, energy in simple harmonic motion, linearity and superposition principle, rotating vector representation of simple harmonic oscillation, motion of simple and compound pendulum (Bar and Kater’s pendulum), loaded spring. Superposition of N collinear harmonic oscillations with (1) equal phase differences and (2) equal frequency differences, Beats Superposition of two perpendicular harmonic oscillations: Graphical and Analytical Methods. Lissajous Figures with equal and unequal frequencies, effect of variation of phase | 12 lectures |  September-October | Problems on SHM, Superposition of various types and lissajous figures |
| **Unit 2: Damped and Forced Oscillations** Damped Oscillations: Equation of motion, dead beat motion, critically damped system, lightly damped system: relaxation time, logarithmic decrement, quality factor Forced Oscillations: Equation of motion, complete solution, steady state solution, resonance, sharpness of resonance, power dissipation, quality factor .  | 8 lectures |  October |  Problems on damped and forced oscillations |
| **Unit 3** : **Coupled Oscillations** Coupled oscillators, normal coordinates and normal modes, energy relation and energy transfer, di-atomic molecules, representation of a general solution as a linear sum of normal modes, normal modes of N coupled oscillators.  | 6 lectures | Nov | Problems on coupled oscillators |
| **Unit 4 : Wave Motion** One dimensional plane wave, classical wave equation, standing wave on a stretched string (both ends fixed), normal modes. Travelling wave solution  |  4Lectures | November-Dec | Related Problems& numericals.  |

**B. Sc. (HONS.) PHYSICS, Semester III**

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| **Name of Paper**  | **Allocation of Lectures** | **Month wise schedule followed by the Department** | **Tutorial/Assignment/ Presentation etc.** |
| **PAPER –CORE: LIGHT & MATTER (50%)** |
| **Unit 2:**  **Interference (10 Hours)** **By Light waves:** Division of amplitude and wave-front. Two-slit interference experiment with photons: Young‟s double slit experiment. Lloyd‟s Mirror. Phase change on reflection: Stokes‟ treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringe). Newton‟s Rings: Measurement of wavelength and refractive index.  | 8 lectures |  Aug-Oct | Problems on interference of light waves |
| **Unit 3: Diffraction (15 Hours)** Fraunhofer diffraction: Single slit. Double slit. Diffraction grating. Resolving power of grating. Fresnel Diffraction: Fresnel‟s Assumptions. Fresnel‟s Half Period Zones for Plane Wave.. | 7 lectures |  Nov-Dec |  Problems on Fresnel Diffraction |