

CURRICULUM PLAN 2022-23 (Even Semester)

B. Sc. (Physical Science)

Semester-IV

Name of Paper & Code	Allocation of Lectures	Month wise schedule followed by the Department	Tutorial/Assignment/Presentation etc.
PAPER –Waves and Optics, Physics-C IV, 42224303			
I Superposition of Two Collinear Harmonic oscillations: Simple harmonic motion (SHM). Linearity and Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats).	6 lectures	January	Problems on superposition principle.
Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. (2 Lectures)	2 lectures	January	Problems on lissajous figures
Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity.	8 lectures	January-February	Related Problems
Sound: Sound waves, production and properties. Intensity and loudness of sound. Decibels. Intensity levels. musical notes. musical scale. Acoustics of buildings (General idea).	6 lectures	February-March	Numericals, Problems
Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle.	3 lectures	March	Related Problems
Interference: Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror & Fresnel's Biprism. 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 Fringes). Newton's Rings: measurement of wavelength and refractive index.	12 Lectures	March	Numericals, Problems, Assignment
Michelson's Interferometer: Construction and working. Idea of form of fringes (no theory needed), Determination of wavelength, Wavelength difference, Refractive index, and Visibility of fringes	4 Lectures	April	Numericals, Problems

Diffraction: Fraunhofer diffraction: Single slit; Double Slit. Multiple slits & Diffraction grating. Fresnel Diffraction: Half-period zones. Zone plate. Fresnel Diffraction pattern of a straight	14 lectures	April	Related Problems.
Polarization: Transverse nature of light waves. Plane polarized light – production and analysis. Circular and elliptical polarization..	6 lectures	April 1	Related Problems.