SUBJECT NO-PH11001, SUBJECT NAME- Physics

LTP- 3-1-0,CRD- 4

SYLLABUS :-

Course Contents

Theory Component:

Overview of vibrations with emphasis on damped and forced oscillations, resonance, coupled oscillations, normal modes.

Wave Motion: longitudinal and transverse waves, wave equation, plane waves, phase velocity, superposition wave packets and group velocity, two and three dimensional waves, polarization.

Electromagnetic Waves: Maxwell's equations, wave equation, plane electromagnetic waves, energy-momentum, Poynting's theorem, electromagnetic boundary conditions, reflection and refraction, interference, Young's experiment, interferometers, diffraction, Fraunhofer diffraction (single slit), dispersion, radiation.

Wave Mechanics: failure of classical physics, qualitative review of relevant experiments, de Broglie waves, uncertainty principle, wave function and Schrodinger equation, probability interpretation, particle on a chain, potential barrier and quantum tunneling, potential well, qualitative summary of simple harmonic oscillator and Hydrogen atom. Occupation probability and examples.

Laboratory Component: Suggested Experiments

1.Oscillation in potential well

2.Normal modes of coupled oscillators

3.Measurement of velocity of acoustic waves

4.Newton's rings

5.Specific rotation of an optically active source

6.Diffraction with laser

7.Dispersive power of a prism

8.Fresnel biprism

9.Franck Hertz experiment

10.Photoelectric effect

11.Measurement of band gap in semiconductors

12.Measurement of Hall effect