

WAVES, OSCILLATIONS, SOUND & LIGHT

1. Introduction

Credits: 4-0-0

2. Course Outline

Simple harmonic motion, Angular simple harmonic oscillator, damped harmonic oscillator, Forced oscillations and Resonance; Simple coupled oscillators. Traveling waves, Superposition principle, Wave speed, Power and intensity in wave motion, Interference of sound waves, Stationary waves, Beats, Waves on strings and surfaces, Audible, ultrasonic and infrasonic waves, Propagation and speed of longitudinal waves, Vibrating systems and sources of sound, Musical instruments, The Doppler effect, Shock waves, Velocity of sound and its measurement, factors affecting the speed of sound Nature and propagation of light, Images, Defects of images, Spherical and Chromatic aberrations, Achromatism of two thin lenses separated by a distance, Optical instruments (Microscopes and Telescopes), Velocity of light and its measurement.

3. Reading Material

1. Fundamentals of Physics by Resnick, Halliday and Walker, 6th Wiley
2. University Physics by Sears and Zemansky, 10th edition, Addison –Wesley series
3. Fundamentals of Optics, Jenkins and White
4. Light by K. G. Mazumdar
5. Geometrical and Physical Optics by P. K. Chakraborty
6. Optics by B. K. Mathur.