

DEPARTMENT OF PHYSICS
Syllabus for APPLIED PHYSICS

Unit -1

Theory of Relativity:

Frame of reference, Galilean principle of relativity, Michelson-Morley experiment, Postulates of special theory of relativity, Lorentz transformations, Length contraction, time dilation, Relativistic addition of velocities, Variation of mass with velocity, Mass energy equivalence, energy-momentum relationship.

Unit-2

(i)Acoustics:

Ultrasonic waves: Production and engineering applications, basis requirements for an acoustically good hall, determination of wavelength, reverberation time, Sabine's formula.

(ii) Wave Optics:

Interference by division of amplitude: Newton's rings experiment, interference by division of wavefront: Fresnel's biprism experiment, Diffraction at single slit, diffraction grating, Resolving Power of grating

Unit-3

(i) X-ray:

Origin of continuous and characteristic X-ray, Duane-Hunt limit for minimum wavelength, Moseley's law, Bragg's law for X-ray diffraction

(ii) Super Conductivity:

Superconductors, Meissner effect, Type-I and Type-II, Superconductors, BCS theory, application of superconductors

Unit-4

Quantum Physics:-

Inadequacy of classical mechanics-Qualitative study of black body radiation and photoelectric effect, Compton effect, De-Broglie's hypothesis, Davison – Germer experiment, Uncertainty principle and its applications, Wave function and wave packet, phase and group velocities, Probabilities and normalization, Schrödinger equation: Time dependent and time independent, Application of Schrödinger equation: particle in a box

Unit -5

(i) Dielectric materials :

Dielectric constant, Dielectric polarization and its types, polar and non polar dielectric materials, E, P and D vectors, Concept of internal fields, Clausius- Mossoti equation.

(ii) Magnetic materials :

Dia, para, ferro and ferrite magnetic materials, hard and soft magnetic materials, hysteresis loop, antiferromagnetism.