Course Outcomes (COs)

Course Out Come B.Sc.Physics	
SEM-I Mechanics	
CO1	Demonstrate the simple phenomenon concerning motion in our daily life. Apply the conservation laws in many physical phenomenons. Formulate the mathematical relations based on physical phenomenon.
CO2	Demonstrate the ability to justify and explain their thinking and approach. Develop proficiency in the analysis of complex physical problems.
CO3	Understand the Philosophical views of Physics. Elaborate and explain the concept of relativity with applications
SEM-II : Thermal Physics	
CO1	Design many simple apparatus or machines based on thermal energy Develop many simple instruments based on optics. Explain the applications of thermal energy and optical phenomenon in daily life. Use the appropriate techniques to explain the thermodynamic and optical process.
CO2	Apply in chemistry, life science and automobile engineering etc Formulate many advance theories based on heat and light. Understand the working of thermometry and optical instruments in medical sciences
CO3	Develop the advance theories and experimental techniques based on heat and light. Understand and explain the practical applications of heat and light.
CO4	Develop proficiency in the analysis of complex thermodynamic system. Explain the application of thermodynamic and optics in Astrophysics.
SEM-III ELECTROMAGNETIC THEORY	
CO1	Design many electric circuits used for many purposes in daily life. Design many hydroelectric generators for generation of energy. Understand the working electrical machines.

	Understand the applications electricity magnetism in medical science.
CO2	Explain about the production of electromagnetic waves. Explain about the dangerous effect of electricity and magnetism to health Understand about the Atmospheric electricity. Develop the advance experimental techniques based on electricity and magnetism
CO3	Understand and explain about the properties of charge for energy generation. Apply the mathematical tools to explain the electric and magnetic phenomenon Understand the concept of charge transport in materials.
SEM-IV WAVES AND OPTICS	
CO1	Fundamentals of Waves -Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at ends, overtones, energy transport, transverse impedance. Longitudinal vibrations in bars- wave equation and its general solution, Special cases: (i) bar fixed at both ends, ii) bar fixed at the midpoint, iii) bar free at both ends, iv) bar fixed at one end, Transverse vibrations in a bar - wave equation and its general solution. Boundary conditions, clamped free bar, free-free bar, bar supported at both ends, Tuning fork.
CO2	Principle of superposition – coherence – temporal coherence and spatial coherence – conditions for Interference of light. Interference by division of wave front: Fresnel's biprism – determination of wave length of light. Determination of thickness of a transparent material using biprism – change of phase on reflection – Lloyd's mirror experiment. Interference by division of amplitude: Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (Cosine law) – Colours of thin films – Non-reflecting films – interference by a plane parallel film illuminated by a point source – Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film) – Determination of diameter of wire-Newton's rings in reflected light with and without contact between lens and glass plate, Newton's rings in transmitted light (Haidinger Fringes) – Determination of wave length of monochromatic light – Michelson Interferometer – types of fringes – Determination of wavelength of monochromatic light, Difference in wavelength of sodium D1,D2 lines and thickness of a thin transparent plate.

CO3	Introduction – Distinction between Fresnel and Fraunhofer diffraction, Fraunhofer diffraction:- Diffraction due to single slit and circular aperture – Limit of resolution – Fraunhofer diffraction due to double slit – Fraunhofer diffraction pattern with N slits (diffraction grating).
CO4	Resolving Power of grating – Determination of wave length of light in normal and oblique incidence methods using diffraction grating
CO5	Fresnel diffraction-Fresnel's half period zones – area of the half period zones –zone plate – Comparison of zone plate with convex lens – Phase reversal zone plate – diffraction at a straight edge – difference between interference and diffraction.
SEM-V MODERN PHYSICS	
CO1	Atomic Spectra: Introduction - Drawbacks of Bohr's atomic model – Sommerfeld's elliptical orbits -relativistic correction (no derivation). Stern & Gerlach experiment, Vector atom model and quantum numbers associated with it. L-S and j-j coupling schemes. Spectral terms, selection rules, intensity rules – spectra of alkali atoms, doublet fine structure, Zeeman Effect, Paschen-Back Effect and Stark Effect (basic idea).
CO2	Molecular Spectroscopy: Types of molecular spectra, pure rotational energies and spectrum of diatomic molecule. Determination of inter nuclear distance. Vibrational energies and spectrum of diatomic molecule. Raman effect, classical theory of Raman effect. Experimental arrangement for Raman effect and its applications.
CO3	Quantum Mechanics Inadequacy of classical Physics: Spectral radiation - Planck's law (only discussion). Photoelectric effect - Einstien's photoelectric equation. Compton's effect - experimental verification.
CO4	Matter waves & Uncertainty principle: de Broglie's hypothesis - wavelength of matter waves, properties of matter waves. Phase and group velocities. Davisson and Germer experiment. Double slit experiment. Standing de Brogile waves of electron in Bohr orbits. Heisenberg's uncertainty principle for position and momentum (x and px), Energy and time (E and t). Gamma ray microscope. Diffraction by a single slit. Position of electron in a Bohr orbit. Complementary principle of Bohr

SEM-VI ELECTRONICS	
CO1	Band theory of P-N junction: Energy band in solids (band theory), valence band, conduction band and forbidden energy gap in solids, insulators, semi conductors and pure or intrinsic semiconductors and impure or extrinsic semi-conductors. N-type semi-conductors, P-type semi-conductors, Fermi level, continuity equation. Diodes: P-N junction diode, Half-wave, full-wave and bridge rectifier. Zener diode & its characteristics. Zener diode as voltage regulator.industrial processes. To study experimentally the qualitative detection of known and unknown radicals and insoluble materials in a mixture
CO2	Bipolar Junction Transistor (BJT) – p-n-p and n-p-n transistors, current components in transistors, CB, CE and CC configurations – transistor as an amplifier -RC coupled amplifier – Frequency response (Qualitative analysis). Feedback concept & Oscillators: Feedback, General theory of feedback–Concepts of oscillators, Barkhausen's criteria, Phase shift oscillator – Expression for frequency of oscillation.
CO3	Special devices- Construction and Characteristics: Photo diode - Shockley diode -Solar cell, Optocouplers - Field Effect Transistor (FET) - FET as an Amplifier - Uni Junction Transistor (UJT), UJT as a relaxation oscillator - Silicon controlled rectifier (SCR) - SCR as a switch.
CO4	Binary number system, conversion of binary to decimal and vice-versa.Binary addition and subtraction (1's and 2's complement methods).Hexadecimal number system.Conversion from binary to hexadecimal and vice-versa, Decimal to hexadecimal and vice-versa. Logic gates: OR, AND, NOT gates, truth tables, realization of these gates using discrete components. NAND, NOR as universal gates, Exclusive – OR gate (EX-OR). De Morgan's Laws – Verification.