COURSE OUTCOMES (CO)	
Course Outcomes	**Aligned Programme Outcomes (PO)**
Students will be able to: 1. Understand many modern devices and technologies based on lasers and optical fibres. 2. Appreciate various material properties which are used in engineering applications and devices. 3. Identify the cause of reverberations in buildings. 4. Analyse the crystal structure of materials. 5. Decide on suitable materials for engineering applications.	• Obtain in-depth knowledge on important Physics concepts. • Carry out independent research work in interdisciplinary areas. • Interact with professionals in related areas. • Communicate ideas and learn new technologies.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week	Topic	Mode of Delivery
1	2nd - 4th week of August	**Lasers** Introduction to Laser-characteristics of Lasers-Spontaneous and stimulated emissions – Einstein's coefficients – population inversion and lasing action – laser systems: Ruby laser, He-Ne Laser, semiconductor laser-applications:–Holography- CD-drive – industrial and medical applications	**Lectures, Power point presentations, Class room discussions.**
2	1st- 3rd week of September	**Fiber Optics** Fermat's principle and Snell's law-optical fiber – principle and construction – acceptance cone - numerical aperture - V-Number - types of fibers, Fabrication: Double Crucible Technique, Vapour phase Oxidation Process – fiber optic communication principle – fiber optic sensors-other applications of optical fibers.	**Lectures, Power point presentations, Class room discussions.**
3	4th week of September -2nd week of October	**Acoustics** Characteristics of musical sound – loudness – Weber-Fechner law – decibel – absorption coefficient – reverberation – reverberation time – Sabine's formula – acoustics of buildings – ultrasonics – production of ultrasonics using piezoelectric method – magnetostriction method- applications.	**Lectures, Power point presentations, Class room discussions.**
4	3rd week of October - 1st week of November	**Crystallography** Crystalline and amorphous solids – lattice and unit cell – seven crystal system and Bravais lattices – symmetry operation – Miller indices – atomic radius – coordination number – packing factor calculation for sc, bcc, fcc – Bragg's law of X-ray diffraction –Laue Method-powder crystal method.	**Lectures, Power point presentations, Class room discussions.**
5	2nd and 3rd week of November	**Magnetic materials, Conductors and Superconductors** ***Magnetic materials***: Definition of terms – classification of magnetic materials and properties – Domain theory of ferromagnetism- hard and soft magnetic materials – applications. ***Conductors***: classical free electron theory (Lorentz –Drude theory) – electrical conductivity ***Superconductors***: definition – Meissner effect – type I & II superconductors – BCS theory (qualitative) – high temperature superconductors – Josephson effect – quantum interference (qualitative) – SQUID – applications.	**Lectures, Power point presentations, Class room discussions.**