

## ENGINEERING PHYSICS

23PHY01	SEMESTER - I / II	L	T	P	C
		ENGINEERING PHYSICS	3	0	0
UNIT-I	SOLID MECHANICS AND MECHANICAL PROPERTIES	<b>9 Hours</b>			
<p>Elasticity - Stress - strain diagram and its uses - factors affecting elastic modulus - Torsional Pendulum - Young's modulus by cantilever - Uniform and non-uniform bending - stress due to bending in beams - Tensile test - plastic deformation - strengthening methods - Creep resistance, fracture - fatigue - methods of increasing fatigue life</p>					
UNIT-II	LASER PRINCIPLES AND OPTICAL FIBERS	<b>9 Hours</b>			
<p>Laser Characteristics - Einstein coefficient &amp; its significance - population inversion - working principle, pumping scheme - Nd:YAG laser - He:Ne laser - Semiconductor laser (homojunction &amp; heterojunction) - advanced applications of laser - light propagation through fibers - acceptance angle - numerical aperture - types of optical fibers - fiber preparation : electro spin method - fiber optic communication - fiber optic sensors</p>					
UNIT-III	CRYSTAL PHYSICS	<b>9 Hours</b>			
<p>Crystal systems - Bravais lattice – planes - Miller indices - d spacing - coordination number and packing factor for SC, BCC, FCC, HCP and Diamond structure - crystal imperfections - type of defects (zero dimension, one dimension, two dimension and three dimension) - crystal growth techniques: Bridgman-Stockbarger, Czochralski</p>					
UNIT-IV	QUANTUM MECHANICS	<b>9 Hours</b>			
<p>Black body radiation - Duality nature - de Broglie hypothesis in terms of energy and wavelength, properties of matter waves - Compton effect, Heisenberg's uncertainty principle - Schrödinger time dependent wave equation - Schrödinger time independent wave equation-particle in one dimensional box - scanning tunneling microscope</p>					
UNIT-V	NANO SCIENCE & ADVANCED ENGINEERING MATERIALS	<b>9 Hours</b>			
<p>Introduction to nano materials - properties of nano materials - quantum confinement (quantum well, wire &amp; dot) - preparation of nano materials - Ball milling &amp; SILAR Techniques - carbon nano tube (CNT) - properties &amp; applications of advanced engineering materials: ceramics-composites - metallic glasses - Shape Memory Alloy (SMA)</p>					

## Engineering Physics - Laboratory

23PHYP1	SEMESTER - I / II	L	T	P	C
		0	0	2	1
Lab Practice	Engineering Physics Laboratory	<b>10 Hours</b>			
1. Determination of rigidity modulus – Torsion pendulum 2. Determination of Young's modulus by non-uniform bending method 3. (a) Determination of wavelength, and particle size using Laser (b) Determination of acceptance angle in an optical fiber 4. Determination of wavelength of mercury spectrum – spectrometer grating 5. Determination of velocity of sound and compressibility of liquid – Ultrasonic interferometer 6. Determination of bandgap of a semiconductor					