

Subject Code:	NS205h	Course Title	Material Science
Contact Hours	L-3, T-0, P-2	Credit	4
Programme	B.Tech	Semester	III
Pre-requisites	NIL		
Evaluation scheme	Quiz I (10%), Mid term (20%), Quiz II (10%), End term (40%), lab (20%)		
<p>Overview of Materials and their applications. Bonding in materials. Crystal systems, packing fraction, nearest neighbour, concept of Bravais Lattice and unit cell. Miller indices in crystalline materials. Defects in crystalline materials, single crystals, poly-crystals and amorphous materials. [12 H]</p> <p>Band theory of solids, conductors, semiconductors and insulators, intrinsic and extrinsic semiconductors, electrical conduction, effect of temperature on conductivity. Heat capacity and thermal conductivity. Stress-strain diagram, elastic and plastic deformation, yield strength, tensile strength, elongation, modulus of elasticity, ductile and brittle fracture. [10 H]</p> <p>Diffusion in solids, Fick's laws and technological application of diffusion. Phase Diagrams of engineering materials; Solidification; Diffusion assisted and diffusion less solid-state phase transformations, Applications and Properties of Ceramic, Polymers and also of their Composite Materials. [10 Lectures]</p> <p>Magnetic materials and their properties, magnetic hysteresis. Elements of superconductivity, Meissner's effect, type-I, type-II semiconductors, BCS Theory. Introduction to nanotechnology, 0D, 1D and 2-D materials, nanoribbons. Advance applications of nanomaterials including spintronics. [10 H]</p>			
Text/Reference books:			
<ol style="list-style-type: none"> 1. Callister, "Materials Science and Engineering" Wiley. 2. Smith, William, "Foundations of Materials Science And Engineering", Mc Graw Hill. 3. V. Raghvan, "Materials Science and Engineering". 3. Poole and Owens "Introduction to nanotechnology", Wiley. 			

Subject Code:	NS205i	Course Title	Culture and Science-a comparison
Contact Hours	L-3, T-0, P-0, GD-1	Credit	4
Programme	B.Tech	Semester	III
Pre-requisites	NIL		
Evaluation scheme	Quiz I (10%), Mid term (30%), Quiz II (10%), End term (50%)		
<p>Science and Humanities. [11L]</p> <p>Magnifying and Classifying in Science, Linear approach to thought in Science, Hierarchical and Horizontal linkages to development through Science [11L]</p> <p>Synthesis and Transformation in Cultural Progress, Concentric approach to thought in Humanities, Concentric Context to development and Culture [20 L]</p> <p>Indian Intellectual Traditions [20 L]</p> <p>Unity in Diversity- From Unity to Multiplicity, Upanishads and 21st Century- Vision and Pluralism, Concept of holiness in a World of Conflict, The Spirit in Human Being, Progress in Science, Progress in Humanities.</p>			
Text/Reference books:			
<ol style="list-style-type: none"> 1. Progress and Values in the Humanities- Volney Gay- Columbia University, New York. 2. A Cultural History of India- A.L.Basham 3. India's Intellectual Traditions- World Association for Vedic Studies 			