

Course Code. :	CH/PH 225001
Course Title :	Advanced Functional Materials
Credits:	L T P C 3 1 0 4
Prerequisites (if any)	Nil
Course Objective	The course “Advanced Functional Materials” is designed to provide a broad introduction to recent developments in advance materials and their applications. The course will bring fundamental insights into the chemical and physical properties of materials.
Course Contents	Introduction and requirement of functional materials, Polymer and composite, Porous materials, Nanomaterials: metal nanoparticles, Oxide nanomaterials Carbon nanotube, Graphene, Ferroelectric, Piezoelectric, Multiferroics, Thermoelectric materials, Supramolecular materials (MOF, COF), Chemo-responsive materials, Biomaterials, Ionic liquids, Liquid crystals.
Text books/ References	<ol style="list-style-type: none"> 1. Science of Engineering Materials and Carbon Nanotubes: C. M. Srivastava and C. Srinivasan, 3rd Edition, New age international, 2010. 2. Nanophysics and Nanotechnology: An Introduction to Modern Concepts in Nanoscience: Edward L Wolf, 2nd Edition, Wiley-VCH, 2008. 3. Porous Materials, D. W. Bruce, Dermot O’Hare, R. I. Walton, 1st Edition, Wiley, 2010. 4. Text book of Polymer Science: Fred W. Billmeyer, 3rd Edition, Wiley 2007. 5. Principles of Polymerization, George Odian, 4th Edition, Wiley 2004. 6. Properties of Materials; Anisotropy, Symmetry, Structure: Robert E. Neuham, Oxford University Press 2005. 7. Physical Properties of crystals: J. F. Nye, Oxford: Clarendon Press 1957. 8. Magnetism and Magnetic Materials: J. M. D. Coey, Cambridge 2010. 9. Supramolecular Chemistry: Concepts And Perspectives: J. Lehn, 1st Edition, Wiley India, 2014. 10. Introduction to Supramolecular Chemistry: Helena Dodziuk, Springer, 2002. 11. Supported Ionic Liquids, Fundamentals and Applications: Rasmus Fehrmann, Anders Riisager, Marco Haumann, Willey, 2014. 12. Liquid Crystal: S. Chandrasekhar, 2nd Edition, Cambridge University Press, 1993. 13. Introduction to Magnetism and Magnetic Materials: David C. Jiles Springer publication, December 13th, 1990.