

Course Code. :	CH/PH 225002
Course Title :	Modern Techniques for Material Characterization
Credits:	L T P C 3 1 0 4
Prerequisites (if any)	Nil
Course Objective	The course “Modern Techniques for Material Characterization” is designed to understand the working principle and study the applicability of the most important methods used in materials characterization.
Course Contents	<p>Spectroscopic characterization: Introduction and necessity of characterization techniques, UV-vis absorption spectroscopy, Raman Spectroscopy, IR Spectroscopy, Fluorescence spectroscopy, Nuclear magnetic resonance, Mass spectroscopy, X-ray photoelectron spectroscopy.</p> <p>Thermal method of analysis: Thermo-gravimetric analysis (TGA), Differential thermal analysis (DTA), Differential scanning calorimetry (DSC)</p> <p>Probing bulk and nano-structure: X-ray Diffraction (XRD), Transmission electron microscopy (TEM), High resolution Transmission electron microscopy (HRTEM),</p> <p>Surface structure and topography: Scanning electron microscopy (SEM), Scanning tunneling microscopy (STM), Atomic force microscopy (AFM)</p>
Text books/ References	<ol style="list-style-type: none"> 1. Introduction to Spectroscopy: 5th Edition, Pavia, Lampman, Kriz, Uyvyan, Books/Cole Cengage Learning 4th Edition, 2009. 2. Materials Characterization, Introduction to Microscopic and Spectroscopic: Yang Leng, Willey, 2nd Edition, 2013. 3. Applications of absorption spectroscopy of organic compounds: John. R. Dyer, PHI, Eastern Economy Edition, 1978. 4. Handbook of Spectroscopy: Günter Gauglitz, Tuan Vo-Dinh, Willey, 2003. 5. Introduction to Solid State Physics: Charles Kittel, 6th Edition, Wiley publication, 1986.