SUBJECT NO-MT31022, SUBJECT NAME- X-RAY DIFFRACTION

LTP- 3-1-0,CRD- 4

SYLLABUS :-

Prerequisite â NilIntroduction to x-ray and electron beam analysis of materials. Properties of x-rays: continuous and characteristics x-rays, absorption, filter, production and detection of x-rays. Diffraction of x-rays: special topics on crystallography, directions and intensities of diffracted beams. Experimental methods in x-ray analysis; Laue method, powder photograph diffractometer and spectrometer measurements. Applications: orientation of single crystal, crystal structures of polycrystalline materials, precise lattice parameter measurements, phase diagram, order-disorder transformation, chemical analysis, residual stress, texture. Electron-specimen interactions: elastically and inelastically scattered electron, x-rays, Auger electrons, electron beam induced currents, cathodoluminescence. Construction of transmission electron microscope, interpretation of diffraction information: selected area and convergent beam electron diffraction patterns. Analysis of TEM and HRTEM micrographs.Text Books:1.B. D. Cullity: Elements of X-Ray Diffraction, 2nd Ed., Addison-Wesley Pub. Co., 1978. 2.P.J. Goodhew, J. Humphreys and R. Beanland: Electron Microscopy and Analysis, Taylor and Francis, London, 2001.