SARDAR PATEL UNIVERSITY Programme & Subject: M.Sc (Materials Science) Semester: III Syllabus with Effect from: June - 2013

Paper Code: PS03CMTS08

Title Of Paper: Modern Characterization Techniques

Total Credit: 4

Unit	Description in detail	Weightage (%)
Ι	Introduction, electromagnetic radiation, generation of X-rays, continuous X-ray spectrum, characteristic X-ray spectrums, absorption. Phase relationship, diffraction, derivation of diffraction condition, diffraction methods, Laue, powder and rotating crystal method, X-ray diffractometer and spectrometer, grain size estimation and texture.	25%
II	X-ray fluorescence, chemical analysis using X-ray spectrometry, general principle, wavelength dispersive and energy dispersive spectrometers.	25%
III	Introduction, classification of structure, the basic optical microscope, characteristics of the microscope, application.	25%
IV	Introduction, electron optical instruments, Analytical Transmission Electron Microscopy, Transmission Electron Microscopy, electron optics, electron beam specimen interaction, signal detectors. Introduction to SEM general uses, samples, example of applications, image contrast, limitations, Atomic Force Microscopy.	25%

Basic Text & Reference Books:-

- Elements of X-ray diffraction –B.D. Cullity.
- Materials characterization –Ruth E. Whan
- Volume 10, ASM Handbook
- > Characterization of Materials, Vol. 2 Elton N. Kaufmann.

