

SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Defence Science)
Semester: III
Syllabus with Effect from: June - 2014

Paper Code: PT03EDSC02	Total Credit: 4
Title Of Paper: Physical Characterization of Advanced Materials	

Unit	Description in Detail	Weightage (%)
I	X-ray Photoelectron Spectroscopy and Auger Electron Spectroscopy: Atomic Model and Electron Configuration, Principles of XPS and AES, Instrumentation, Routine Limits of XPS XPS Applications and Case Studies, AES Applications	25%
II	Scanning Tunneling Microscopy and Atomic Force Microscopy: Working Principle, Instrumentation, Modes of Operation, Differences between STM and AFM, Applications	25%
III	Transmission Electron Microscopy: Basics of Transmission Electron Microscopes, Reciprocal Lattice, Specimen Preparation, Bright-Field and Dark-Field Images, Electron Energy Loss Spectroscopy; Scanning Electron Microscopy: Introduction to Scanning Electron Microscopes, Electron Beam–Specimen Interaction, SEM Operating Parameters, Applications	25%
IV	Laser Confocal Fluorescence Microscopy: Fluorescence and Fluorescent Dyes, Fluorescence Microscopy, Laser Confocal Fluorescence Microscopy, Applications of LCFM	25%

Basic Text & Reference Books:-

- Zhang S., Li L., Kumar A., Materials Characterization Techniques. CRC Press
- Tyagi A. K., Roy M., Kulkshreshtha S. K., Banerjee S. Advanced Techniques for Materials Characterization, Trans Tech Publications
- Ishida H., Characterization of Composite Materials, Materials Characterization Series, Brundle R. C., Evans C. A. Jr., Momentum Press, LLC, New York

