CYL 729 : Materials Characterization : 3 Credits (3-0-0) 2011-12 , II Semester

Details of Syllabus :

Introduction to materials (1)
Molecular Symmetry, Point Groups (2)
Common polyhedras, connectivity and Structures (3)
Space groups, (2)

Quiz 1 (10 Marks)

X-rays and Powder X-ray diffraction (6)

MINOR – I (20 Marks)

Single crystal X-ray diffraction (6)
Electron Microscopy : SEM, TEM, SAED, EDS, AFM, STM (7)
Light scattering (SLS & DLS) (1)

MINOR – II (20 Marks)

Thermal Analysis : TGA, DTA, DSC (2)
Density measurements, Surface area (BET) ; (2)
Spectroscopy : Absorption (Uv-vis), I.R , Photoluminiscence(fluorescence), Raman (3)
Solid State NMR : (3)

Quiz (2) 10 Marks

Properties (4)
(Electrical properties, Dielectric Properties, Magnetic Properties,
Superconducting Properties

MAJOR (40 Marks) (will include entire syllabus)

42 Lectures (50 min each)

Books recommended :

1. Structure of Materials : An introduction to Crystallography, Diffraction and Symmetry, Marc De Graef and Michael R McHenry, Cambridge Univ. Press, 2007. (Available in Library).
2. X-Ray Structure Determination: A practical Guide, 2nd Edition, G H Stout and L H Jensen.
3. Solid State Chemistry and its applications by A.R. West (Available in Library).
4. Transmission electron microscopy, DB Williams and C B Carter, Springer (1996).