SUBJECT NO-CY50033, SUBJECT NAME- Solid State Chemistry

LTP- 3-0-0,CRD- 3

SYLLABUS :-

CY50015 Solid State Chemistry (3-0-0: 3 credits)

Crystal structure of solids: Fundamental of lattices, unit cell, atomic coordinates, Bravais lattices, crystal direction and planes, types of close packing, packing efficiency, radius ratios; structure types – NaCl, ZnS, Na2O, CdCl2, wurtzite, nickel arsenide, CsCl, CdI2, rutile and Cs2O, perovskite ABO3, K2NiF4, spinels.

Crystal diffraction by X-rays, Neutrons and Electrons; Structure determination by X-ray diffraction, Atomic form factor, structure factor and integrated intensity, Concept of reciprocal lattice, Brillouin Zones.Band Theory, Semiconductors (intrinsic & extrinsic), and Devices, Measurement of Band Gaps, Fermi level; Imperfections in Solids: Point, Line, Surface; Thermodynamics of the Defects; Phase Stability: Unary and Binary Phase Diagrams; Ionic Conductivity & Photoconductivity; Colour Centers, Traps, Phosphors; Electrical and Magnetic Properties (Hall Effect); BCS-type superconductivity.

Books: Solid State Chemistry and its applications by A. R. West; Solid State Chemistry – An Introduction by L. Smart and E. Moore; Structure and Dynamics – An atomic view of Materials, M. T. Dove; Material Science and Engineering, V. Raghavan.