Course Title	**SOLID STATE PHYSICS-I**
Course Code	**MPHY-341**
Credit Hours	**CH3**
Pre- requisites	**MPHY-221**
Learning outcomes	This course deals with basic principles and techniques of Solid-State Physics.
Contents	**Crystal structure:** fundamental types of lattices, primitive and non-primitive unit cells, Wigner-Seitz unit cell, index system for crystal planes, simple crystal structures. **Wave diffraction and Reciprocal lattice:** the reciprocal lattice, diffraction of waves by crystals, scattered wave amplitude, Bragg's law, Brillouin zones, **Crystal Binding:** crystals of inert gases, ionic crystals, covalent crystals, metals, hydrogen bonds, **Crystal vibrations**: vibrations of crystals with mono-atomic basis, two atoms per primitive basis, quantization of elastic waves, phonon momentum, inelastic scattering by phonons, **Thermal properties:** Lattice heat capacity, Classical model, Einstein Model, Debye model, the thermal conductivity and resistivity, Umklapp processes, **Crystal defects**: point defects (Frenkel defects, Schottky defects, impurity defects), Line defects.
Teaching-learning Strategies	Classroom teaching / Lecturing
Assignments- Types and Number	Problem sheet: 3-4
Assessment and Examinations	Mid-Term Assessment: 35% Formative Assessment: (25%): It includes classroom participation, attendance, assignments and presentations, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc. Final Term Assessment: 40%
Text Books	1. Introduction to Solid State Physics by C. Kittle (8th Edition), Wiley (2012). 2. Solid State Physics by N. W. Ashcroft and D. Mermin, CBS Publishing (1987). 3. Solid State Physics by J. S. Blakemore, Cambridge (1991). 4. Solid State Physics by M. A. Wahab, Narosa Publishing House (1999). 5. Physics of Solids, by J. B. Ketterson, Oxford, (2016). 6. Elementary and Solid-State Physics by M. A. Omar, Pearson (2000). 7. Solid State Physics by S.O. Pillai, New Age International, (2006).