## **CURRICULUM PLAN 2024-2025**

## Even Semester: V, III, I Dr. Rashmi Menon Dept. of Physics

B.Sc.(PS)-III<sup>rd</sup> year

DSC 6: Solid State Physics -30 Periods  Crystal Structure: Solids: amorphous and crystalline materials, lattice translation vectors, lattice with a basis, unit cell, types of lattices, Miller indices, reciprocal lattice, Ewald's construction (geometrical approach), Brillouin zones, diffraction of X-rays by crystals. Bragg's law  Elementary Lattice Dynamics: Lattice vibrations and phonons: linear monoatomic and diatomic chains, acoustical and optical phonons, Dulong and Petit's law, qualitative discussion of Einstein and Debye theories, T3 law.  Elementary Band Theory: Qualitative understanding of Kronig and Penny model (without derivation) and formation of bands in solids, concept of effective mass, Hall effect in semiconductor, Hall coefficient, application of Hall Effect, basic introduction to superconductivity  Magnetic Properties of Matter: dia-, para-, and ferro- magnetic materials, classical Langevin theory of dia- and paramagnetism (no quantum mechanical treatment), qualitative discussion about Weiss's theory of ferromagnetism and	Name of Paper and Code	Allocation of	Month-wise Schedule
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curve hysteresis and energy loss	curve hysteresis and energy loss		
<b>Dielectric Properties of Materials:</b> 3 25-April to 2-May		3	25-April to 2-May
Polarization, local electric field in solids,	_		
electric susceptibility, polarizability,			
Clausius Mossoti equation, qualitative	1		
discussion about ferroelectricity and PE			
hysteresis loop	1		