

AMEE09 ELECTRICAL & ELECTRONICS ENGINEERING MATERIALS

UNIT-1 CRYSTAL STRUCTURE OF MATERIALS:

- 1.1 Bonds in solids, crystal structure,
- 1.2 Co-ordination number, atomic packing factor,
- 1.3 Miller Indices,
- 1.4 Bragg's law and x-ray diffraction,
- 1.5 Structural Imperfections, crystal growth
- 1.6 Energy bands in solids,
- 1.7 Classification of materials using energy band.

UNIT-2 CONDUCTIVITY OF METALS:

- 2.1 Electron theory of metals,
- 2.2 Factors affecting electrical resistance of materials,
- 2.3 Thermal conductivity of metals,
- 2.4 Heat developed in current carrying conductors,
- 2.5 Thermoelectric effect, superconductivity and super conducting materials,
- 2.6 Properties and applications of electrical conducting and insulating materials,
- 2.7 Mechanical properties of metals

UNIT-3 MECHANISM OF CONDUCTION IN SEMICONDUCTOR MATERIALS

- 3.1 Types of semiconductors,
- 3.2 Current carriers in semiconductors,
- 3.3 Hall effect, Drift and Diffusion currents, continuity equation,
- 3.4 P-N junction diode, junction transistor,
- 3.5 FET & IGFET, properties of semi-

UNIT-4 MAGNETIC PROPERTIES OF MATERIAL

- 4.1 Origin of permanent magnetic dipoles in matters,
- 4.2 Classification Diamagnetism,
- 4.3 Para magnetism, Ferromagnetism,
- 4.4 Anti-ferromagnetism and Ferrimagnetism's,
- 4.5 Magnetostriction, properties of magnetic materials,
- 4.6 Soft and hard magnetic materials, permanent magnetic materials.

References Books:

1. Solymar, "Electrical Properties of Materials" Oxford University Press.
2. Ian P. Hones, "Material Science for Electrical and Electronic Engineering," Oxford University Press.
3. G.P. Chhalotra & B.K. Bhat, "Electrical Engineering Materials" Khanna Publishers.
4. T. K. Basak, "Electrical Engineering Materials" New age International.