

ADVANCED NANOMATERIALS

Unit – I

Fundamentals of magnetic materials, Dia, Para , Ferro , Antiferro , Ferri, Superparamagnetic materials AND giant and colossal magneto- resistance. Important properties in relation to nanomagnetic materials.

Unit – II

Nanostructure Magnetism: Effect Bulk Nanostructuring of Magnetic property; Giant and colossal Magnetic resistance; Super Para Magnetism in metallic nanoparticle; Super para magnetism/FM in Semi- conduction quantum dots.

Unit – III

Carbon Nano Structures: Introduction; Fullerenes, C₆₀, C₈₀ and C₂₄₀ Nanostructures; Properties & Applications (mechanical, optical and electrical).

Unit – IV

Thermo Electric Materials (TEM) : Concept of phonon, Thermal conductivity, Specific heat, Exothermic & endothermic processes Different types of TEM; Bulk TEM Properties. One dimensional TEM; Composite TEM; Applications.

Reference:

1. Nanocrystalline Alloys and Magnetic Nanomaterials – Brian Cantor
2. Physics of Magnetism – S. Chikazumi and S.H. Charap.
3. Physical Theory of Magnetic Domains – C. Kittel.
4. Magnetostriction and Magnetomechanical Effects – E. W. Lee.
5. Nanoscale materials – Liz Marzan and Kamat.
6. Physical properties of Carbon Nanotube – R Satio.
7. Applied Physics of Carbon Nanotubes: Fundamental of Theory, Optics And Transport Devices S. Subramony & S.V. Rotkins.
8. Carbon Nanotubes: Properties and Applications – Michael J. O'Connell
9. CARBON NANOTECHNOLOGY – Liming Dai.
10. Nanotubes and Nanowires – CNR Rao and A Govindraj RCS Publishing.
11. CRC Handbook of Thermoelectrics, Ed. CR Rowe