Unit-3: MAGNETISM AND MAGNETIC EFFECTS OF ELECTRIC CURRENT

LEARNING OBJECTIVES

In this unit, the student is exposed to

- Earth's magnetic field and magnetic elements
- Basic property of magnets
- Statement of Coulomb inverse square law of magnetism
- Magnetic dipole
- Magnetic induction at a point due to axial line and equatorial line
- Torque acting on a bar magnet in a uniform magnetic field
- Potential energy of a bar magnet placed in a uniform magnetic field
- Tangent law and tangent Galvanometer
- Magnetic properties – permeability, susceptibility etc
- Classification of magnetic materials – dia, para and ferro magnetic materials
- Concept of Hysteresis
- Magnetic effects of electric current – long straight conductor and circular coil
- Right hand thumb rule and Maxwell's right hand cork screw rule
- Biot-Savart's law – applications
- Current loop as a magnetic dipole

- Magnetic dipole moment of revolving electron
- Ampere’s circuital law – applications
- Solenoid and toroid
- Lorentz force – charged particle moving in an electromagnetic field
- Cyclotron
- Force on a current carrying conductor in a magnetic field
- Force between two long parallel current carrying conductors
- Torque on a current loop in a magnetic field
- Moving coil Galvanometer