**17EC2104 – ELECTRO MAGNETIC FIELDS AND WAVES**

**UNIT-I**

**REVIEW OF COORDINATE SYSTEMS:** Introduction to coordinate systems, Cartesian, Cylindrical and spherical coordinate systems, Vector transformations, Vector calculus.

**UNIT-II**

**ELECTROSTATIC FIELDS:** Coulomb’s Law, Electric Field Intensity, Electric Flux Density –Gauss’s Law. Gauss’s law in point form. Electric Potential-Potential Gradient-Energy Stored in Electric Field.

**UNIT-III**

**CONDUCTORS AND DIELECTRICS:** Current and Current Density- Continuity Equation-Conductors-Ohms Law, Resistance, power dissipation and Joules law. Dielectrics: Dipole Moment-Polarization-bound Charge Densities-Boundary Conditions, Capacitance.

**UNIT-IV**

**MAGNETOSTATIC FIELDS:** Amperes force law, Biot-Savart’s Law, Lorentz force law, Ampere’s circuital law in point form, Magnetic Vector Potential

**UNIT-V**

**MAGNETIC FIELD IN MATERIALS:** Dipole Moment, Magnetization and bound current densities. Boundary Conditions- Inductance, Energy Stored in Magnetic Field.

**UNIT-VI**

**MAXWELL’S EQUATIONS:** Faraday’s law, Motional and transformer induced EMFs, Faraday’s law in point form. Displacement current, Maxwell’s equations in differential and integral forms.

**TEXT BOOKS:**

1. Matthew N.O.Sadiku: “Elements of Engineering Electromagnetics” Oxford University Press, 4thedition, 2007.
2. E.C. Jordan & K.G. Balmain “Electromagnetic Waves and Radiating Systems.” Pearson Education/PHI 4thedition 2006.

**REFERENCES:**

1. Narayana Rao, N: “Elements of Engineering Electromagnetics” 6th edition, Pearson Education, New Delhi, 2006.
2. G.S.N. Raju, Electromagnetic Field Theory & Transmission Lines, Pearson Education, 2006.