CURRICULUM DEVELOPMENT PLAN: Dr. V. Bhasker Raj

B.Sc. Physical Science Ist Semester (Even Semester, 2024-2025)

Paper: Electricity and Magnetism; UPC: 2222511201; Credit: 04 (Lecture-02, Prac.-02)

Topics	Allocation of Lectures (hrs)	Month Wise schedule	Tutorial/assignment/ Presentation etc.
Unit 4: **DC Circuits:** Review of Kirchhoff's Voltage and Current Laws, Thevenin theorem, Norton theorem, Superposition theorem, Maximum Power Transfer theorem.	05	January-February	• Syllabus Overview • Reference Books • Derivations • Problem-solving • Students' difficulties
Unit 1: **Electrostatics:** Electric field, electric flux, Gauss' theorem in electrostatics, applications of Gauss' theorem (linear, plane and spherical charge distribution), line integral of electric field, electric potential due to a point charge, electric potential and electric field of a dipole and charged disc, capacitance due to parallel plates and spherical condenser. Electrostatic energy of system of charge (charged sphere), dielectric medium, dielectric polarization, displacement vector, Gauss' theorem in dielectrics, parallel plate capacitor filled with dielectric.	10	February-March	• Derivations • Problem-solving • Students' difficulties
Unit 2: **Magnetostatics:** Magnetic force between current elements and definition of magnetic field B, Biot-Savart's law and its applications (current carrying straight conductor, current carrying circular coil, current carrying solenoid), divergence and curl of magnetic field, Ampere's circuital law, magnetic properties of materials (magnetic intensity, magnetic induction, permeability, magnetic susceptibility), brief introduction of dia-, para- and ferromagnetic materials	08	March-April	• Derivations • Problem-solving • Students' difficulties • Assignments
Unit 3: **Electromagnetic Induction:** Faraday's laws of electromagnetic induction, Lenz's law, selfinductance of single coil, mutual inductance of two coils, energy stored in magnetic field. Maxwell`s equations and equation of continuity of current, displacement current	07	April-May	• Derivations • Problem-solving • Students' difficulties • Class Test • Previous year's Question Papers