

Department of Physics
SEMESTER – II(UG/SHPHS/201/C-3) CORE-T-3

Electricity and Magnetism

Credit-4; Full Marks: 25

Subject Teacher: DR BIPUL SARKAR

SYLLABUS UNITIZATION

Month	Week	Topics to be taught
March	2	Magnetic force between current elements and definition of Magnetic Field B. Biot-Savart's Law and its simple applications: straight wire and circular loop.
March	3	Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole).
March	4	Ampere's Circuital Law and its application to (1) infinite straight wire, (2) Infinite planar surface current, and (3) Solenoid.
April	1	Properties of B: curl and divergence. Axial vector property of B and its consequences. Vector Potential.
April	2	Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field.
April	3	Class Test
April	4	Faraday's Law. Lenz's Law. Self-Inductance and Mutual Inductance.
May	1	Reciprocity Theorem. Energy stored in a Magnetic Field.
May	2	Introduction to Maxwell's Equations. Charge Conservation and Displacement current
May	3	Class Test
May	4	Magnetization vector (M). Magnetic Intensity (H). Magnetic Susceptibility and permeability.
June	1	Magnetic Susceptibility and permeability.
June	2	Relation between B, H, M. Ferromagnetism. B-H curve and hysteresis.
June	3	Class Test
June	4	Revision