**Govt. College Barota, Gohana**

**Session 2024-25 Semester 2nd (Even)**

**Lesson Plan for B.Sc Physical Sciences**

**Name of Assistant Professor:** Dr. Mukesh Sheoran

**Name of Program :** UG Multidisciplinary Program in Physics

**Name of Course :** Discipline Specific Course/ Major Course (DSC)

**Nomenclature of Course : Electricity and Magnetism**

**Course Code : 24PHY402DS01**

**Credits : 02 M.M : 35**

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| **MONTH** | **WEEK** | **SYLLABUS** |
| **February** | 1st Week | Scalars and vectors, Dot and Cross Product, Triple Vector Products. |
|  | 2nd week | Scalar and Vector Fields, Differentiation of Vector, Gradient of Scalar and its physical significance. Integration of a vector (Line, surface and volume integral and their physical significance). |
|  | 3rd week | Derivation of field E from potential as Gradient, Derivation of Laplace and Poisson’s equations. Electric Flux, Guass Law and its applications. Electric Flux, Guass Law and its applications. |
|  | 4th week | Mechanical force of charged surface, Energy per unit volume. Test of Unit 1. |
|  | 5th week | Force on a dipole in an external field, Electric currents in atoms, Electron Spin and Magnetic moment. |
| **March** | 1st Week | Type of magnetic materials, Magnetisation vector (M), Magnetic Intensity (H), Magnetic Susceptibility and permeability. Relation between B,H and M. Electronic Theory of Diamagnetism. Electronic Theory of Paramagnetism. |
|  | 2nd week | Domain Theory of Ferromagnetism, Cycle of magnetization- B-H Curve and Hysteresis loop, Energy Dissipation. |
|  | 4th week | Displacement Current, Vector and scalar potentials. |
|  | 5th Week | Boundary conditions at interface between two different media. Propagation of electromagnetic wave (Basic idea, no derivation). Poynting vector and Poynting theorem. |
| **April** | 1st Week | DC current Circuits: Electric current and current density. |
|  | 2nd week | Electrical conductivity and Ohm’s law (Review).Applications to dc circuits. |
|  | 3rd week | Growth and decay of current in circuit with (a) C-R circuit (b) R-I circuit  (c) C-I circuit (d) C-R-I circuit |
|  | 4th Week | AC Circuits-A resonance circuit, Phasor, Complex Reactance and Impedance, Analysis for RL,RC and LC circuits |
|  | 5th Week | Series LCR Ciircuit (1) Resonance (2) Power Dissipation (3) Quality Factor and (4) Band width, |
| May | 1st Week | Parallel LCR Circuit |
|  | 2nd week | Test-I with revision of 1st unit |
|  | 3rd week | Test-II with revision of unit 2nd and 3rd |
|  | 4th Week | Test III with Revision of 4th Unit |

**Sign of Concerned Teacher Sign of Principal**