Discipline **:** **ELECTRICAL ENGG.**	Semester : **2nd**	Name of the Teaching Faculty: **DIBYAJYOTI SAMANTRAY**
Subject: **ENGG. PHYSICS**	No. of days/per week class allotted: **04**	Semester from date : **25/10/2022 to 31/01/2023,**20/03/2023 to 24.06.2023 **,** No. of Weeks: 15

Week	Class day	Theory/ Practical Topics
1st	1st	Physical quantities - (Definition) Definition of fundamental and derived units, systems of units (FPS, CGS, MKS and SI units).
	2nd	1.3 Definition of dimension and Dimensional formulae of physical quantities.
	3rd	Dimensional equations and Principle of homogeneity. Checking the dimensional correctness of Physical relations.
	4th	2.1 Scalar and Vector quantities (definition and concept), Representation of a Vector – examples, types of vectors.
2nd	1st	Triangle and Parallelogram law of vector Addition (Statement only). Simple Numerical. Resolution of Vectors – Simple Numericals on Horizontal and Vertical components.
	2nd	2.4 Vector multiplication (scalar product and vector product of vectors).
	3rd	3.1 Concept of Rest and Motion.
	4th	Displacement, Speed, Velocity, Acceleration & FORCE (Definition, formula, dimension & SI units). Equations of Motion under Gravity (upward and downward motion) - no derivation.
3rd	1st	3.4 Circular motion: Angular displacement, Angular velocity and Angular acceleration (definition, formula & SI units).
	2nd	3.5 Relation between –(i) Linear & Angular velocity, (ii) Linear & Angular acceleration).
	3rd	3.6 Define Projectile, Examples of Projectile
	4th	3.7 Expression for Equation of Trajectory, Time of Flight, Maximum Height and Horizontal Range for a projectile fired at an angle, Condition for maximum Horizontal Range.
4th	1st	Work – Definition, Formula & SI units. Friction – Definition & Concept.
	2nd	4.3 Types of friction (static, dynamic), Limiting Friction (Definition with Concept).
	3rd	4.4 Laws of Limiting Friction (Only statement, No Experimental Verification).
	4th	4.5 Coefficient of Friction – Definition & Formula, Simple Numericals.
5th	1st	4.6 Methods to reduce friction.
	2nd	Newton's Laws of Gravitation – Statement and Explanation. Universal Gravitational Constant (G)- Definition, Unit and Dimension.
	3rd	Acceleration due to gravity (g)- Definition and Concept. Definition of mass and weight.
	4th	5.5 Relation between g and G.

Week	Class day	Theory/ Practical Topics
6th	1st	5.6 Variation of g with altitude and depth (No derivation – Only Explanation).
	2nd	5.7 Kepler's Laws of Planetary Motion (Statement only).
	3rd	6.1 Simple Harmonic Motion (SHM) - Definition & Examples.
	4th	6.2 Expression (Formula/Equation) for displacement, velocity, acceleration of a body/ particle in SHM
7th	1st	Wave motion – Definition & Concept. Transverse and Longitudinal wave motion – Definition, Examples & Comparison
	2nd	6.5 Definition of different wave parameters (Amplitude, Wavelength, Frequency, Time Period.
	3rd	6.6 Derivation of Relation between Velocity, Frequency and Wavelength of a wave
	4th	6.7 Ultrasonics – Definition, Properties & Applications.
8th	1st	Heat and Temperature – Definition & Difference Units of Heat (FPS, CGS, MKS & SI).
	2nd	Specific Heat (concept, definition, unit, dimension and simple numerical) Change of state (concept), Latent Heat (concept, definition, unit, dimension and simple numerical)
	3rd	Thermal Expansion – Definition & Concept Expansion of Solids (Concept)
	4th	7.7 Coefficient of linear, superficial and cubical expansions of Solids – Definition & Units.
9th	1st	7.8 Relation between **α**, **β** & **ϒ**
	2nd	Work and Heat - Concept & Relation. Joule's Mechanical Equivalent of Heat (Definition, Unit)
	3rd	7.11 First Law of Thermodynamics (Statement and concept only)
	4th	Reflection & Refraction – Definition. Laws of reflection and refraction (Statement only)
10th	1st	8.3 Refractive index – Definition, Formula &Simple numerical.
	2nd	Critical Angle and Total internal reflection – Concept, Definition & Explanation Refraction through Prism (Ray Diagram & Formula only – NO derivation)
	3rd	8.6 Fiber Optics – Definition, Properties & Applications.
	4th	Electrostatics – Definition & Concept. Statement & Explanation of Coulombs laws, Definition of Unit charge.
11th	1st	Absolute & Relative Permittivity (**ε**) – Definition, Relation & Unit. Electric potential and Electric Potential difference (Definition, Formula & SI Units).
	2nd	Electric field, Electric field intensity (E) – Definition, Formula & Unit. Capacitance - Definition, Formula & Unit.
	3rd	9.7 Series and Parallel combination of Capacitors (No derivation, Formula for effective/Combined/total capacitance & Simple numericals)
	4th	Magnet, Properties of a magnet. Coulomb's Laws in Magnetism – Statement & Explanation, Unit Pole (Definition)

Week	Class day	Theory/ Practical Topics
12th	1st	Magnetic field, Magnetic Field intensity (H) - (Definition, Formula & SI Unit). Magnetic lines of force (Definition and Properties)
	2nd	9.12 Magnetic Flux (**Φ**) & Magnetic Flux Density (B) – Definition, Formula & Unit.
	3rd	10.1 Electric Current – Definition, Formula & SI Units.
	4th	10.2 Ohm's law and its applications
13th	1st	10.3 Series combination of resistors (No derivation, Formula for effective/Combined/ total resistance & Simple numericals)
	2nd	10.3 Parallel combination of resistors (No derivation, Formula for effective/Combined/ total resistance & Simple numericals)
	3rd	10.4 Kirchhoff's laws (Statement & Explanation with diagram).
	4th	10.5 Application of Kirchhoff's laws to the Wheatstone Bridge - Balanced condition of Wheatstone Bridge – Condition of balanced (Equation)
14th	1st	11.1 Electromagnetism – Definition & Concept.
	2nd	11.2 Force acting on a current carrying conductor placed in a uniform magnetic field, Fleming's Left Hand Rule
	3rd	11.3 Faraday's Laws of Electromagnetic Induction (Statement only)
	4th	Lenz's Law (Statement) Fleming's Right Hand Rule
15th	1st	11.6 Comparison between Fleming's Right Hand Rule and Fleming's Left Hand Rule.
	2nd	LASER & laser beam (Concept and Definition) Principle of LASER (Population Inversion & Optical Pumping)
	3rd	12.3 Properties & Applications of LASER
	4th	12.4 Wireless Transmission – Ground Waves, Sky Waves, Space Waves (Concept & Definition)

1. Text Book of Physics for Class XI (Part-I, Part-II) N.C.E.R.T
2. Text Book of Physics for Class XII (Part-I, Part-II) N.C.E.R.T
3. Text Book of Engineering Physics by Barik, Das, Sharma, Kalyani Publisher
4. Concepts in Physics by H. C. Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi

Syllabus coverage upto I.A

Units 1,2,3,4,5,6