Lesson Plan

Discipline: CIVIL & MECHANICAL, Semester: 1ST , Name of Faculty : Siprasubhadarshini Jena		
Subject: Engg. Physics	**No. of days/ weekClass allotted:** 4	**Semester From Date:** 16.08.2023 **To date :** 11.12.2023
Week	**Class Day**	**Theory**
1st	1st	UNITS & DIMENSIONS Physical quantities - (Definition), Definition of fundamental and derived units, systems of units (FPS, CGS, MKS and SI units)
	2nd	Definition of dimension and Dimensional formulae of physical quantities.
	3rd	Dimensional equations and Principle of homogeneity. Checking the dimensional correctness of Physical relations.
	4th	SCALARS & VECTORS 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	Vector multiplication (scalar product and vector product of vectors).
	3rd	KINEMATICS Concept of Rest and Motion. Displacement, Speed, Velocity,
	4th	Acceleration & FORCE (Definition, formula, dimension & SI units). Equations of Motion under Gravity (upward and downward motion) - no derivation.
3rd	1st	Circular motion: Angular displacement, Angular velocity and Angular acceleration (definition, formula & SI units).
	2nd	Relation between – (i) Linear & Angular velocity, (ii) Linear & Angular acceleration).
	3rd	Define Projectile, Examples of Projectile. Expression for Equation of Trajectory,
	4th	Time of Flight, Maximum Height and Horizontal Range for a projectile fired at an angle, Condition for maximum Horizontal Range.
4th	1st	WORK & FRICTION Work – Definition, Formula & SI units.
	2nd	Friction – Definition & Concept.
	3rd	Types of friction (static, dynamic), Limiting Friction (Definition with Concept).
	4th	Laws of Limiting Friction (Only statement, No Experimental Verification). Coefficient of Friction – Definition & Formula, Simple Numericals.
5th	1st	Methods to reduce friction.
	2nd	GRAVITATION 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.
	4th	Definition of mass and weight. Relation between g and G.
6th	1st	Variation of g with altitude and depth (No derivation – Only Explanation).
	2nd	Kepler's Laws of Planetary Motion (Statement only).
	3rd	OSCILLATIONS & WAVES Simple Harmonic Motion (SHM) - Definition & Examples.

	4th	Expression (Formula/Equation) for displacement, velocity, acceleration of a body/ particle in SHM.
7th	1st	Wave motion – Definition & Concept.
	2nd	Transverse and Longitudinal wave motion – Definition, Examples & Comparison.
	3rd	Definition of different wave parameters (Amplitude, Wavelength, Frequency, Time Period. Derivation of Relation between Velocity, Frequency and Wavelength of a wave
	4th	Ultrasonics – Definition, Properties & Applications.
8th	1st	HEAT & THERMODYNAMICS 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	Coefficient of linear, superficial and cubical expansions of Solids – Definition & Units.
9th	1st	Relation between α, β & Υ
	2nd	Work and Heat - Concept & Relation. Joule's Mechanical Equivalent of Heat (Definition, Unit)
	3rd	First Law of Thermodynamics (Statement and concept only)
	4th	OPTICS Reflection & Refraction – Definition. Laws of reflection and refraction (Statement only)
10th	1st	Refractive index – Definition, Formula &Simple numerical.
	2nd	Critical Angle and Total internal reflection – Concept, Definition & Explanation
	3rd	Refraction through Prism (Ray Diagram & Formula only – NO derivation).. Fiber Optics – Definition, Properties & Applications
	4th	ELECTROSTATICS & MAGNETOSTATICS Electrostatics – Definition & Concept. Statement & Explanation of Coulombs laws, Definition of Unit charge. Absolute & Relative Permittivity (ε) – Definition, Relation & Unit.
11th	1st	Electric potential and Electric Potential difference (Definition, Formula & SI Units).
	2nd	Electric field, Electric field intensity (E) – Definition, Formula & Unit.
	3rd	Capacitance - Definition, Formula & Unit.
	4th	Series and Parallel combination of Capacitors (No derivation, Formula for effective/Combined/total capacitance & Simple numericals).
12th	1st	Magnet, Properties of a magnet. Coulomb's Laws in Magnetism – Statement & Explanation, Unit Pole (Definition).
	2nd	Magnetic field, Magnetic Field intensity (H) - (Definition, Formula & SI Unit). Magnetic lines of force (Definition and Properties) Magnetic Flux (Φ) & Magnetic Flux Density (B) – Definition, Formula & Unit.
	3rd	CURRENT ELECTRICITY Electric Current – Definition, Formula & SI Units.
	4th	Ohm's law and its applications.

13th	1st	Series and Parallel combination of resistors (No derivation, Formula for effective/ Combined/ total resistance & Simple numericals).
	2nd	Kirchhoff's laws (Statement & Explanation with diagram).
	3rd	Application of Kirchhoff's laws to Wheatstone bridge
	4th	Balanced condition of Wheatstone's Bridge – Condition of Balance (Equation).
14th	1st	ELECTROMAGNETISM & ELECTROMAGNETIC INDUCTION Electromagnetism – Definition & Concept.
	2nd	Force acting on a current carrying conductor placed in a uniform magnetic field
	3rd	Fleming's Left Hand Rule
	4th	Faraday's Laws of Electromagnetic Induction (Statement only) Lenz's Law (Statement)
15th	1st	Fleming's Right Hand Rule, Comparison between Fleming's Right Hand Rule and Fleming's Left Hand Rule.
	2nd	MODERN PHYSICS LASER & laser beam (Concept and Definition)
	3rd	Principle of LASER (Population Inversion & Optical Pumping) Properties & Applications of LASER
	4th	Wireless Transmission – Ground Waves, Sky Waves, Space Waves

BOOK REFERNCE:

1. ENGINEERING PHYSICS FOR DIPLOMA STUDENTS
2. +2 PHYSICS BY S. L ARORA

16.08.2023
S Jana
Lect. Physics