Lesson Plan

Discipline: Civil/Mechanical	Semester: 2nd	Name of the teaching faculty: Sushrimayee Behera
Subject: Physics	No. of days/per week Class Allotted: 4	Semester from: 29/01/24 to 17/05/24 No. of weeks:15
Week	**Class day**	**Theory Topics**
1st	1st	UNITS AND DIMENSIONS 1.1 Physical quantities - (Definition). 1.2 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 AND 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.
	2nd	Resolution of Vectors – Simple Numericals on Horizontal and Vertical components.
	3rd	2.4 Vector multiplication (scalar product and vector product of vectors).
	4th	KINEMATICS Concept of Rest and Motion.
3rd	1st	3.2 Displacement, Speed, Velocity, Acceleration & FORCE (Definition, formula, dimension & SI units).

	2nd	Equations of Motion under Gravity (upward and downward motion) - no derivation.
	3rd	Circular motion: Angular displacement, Angular velocity and Angular acceleration.
	4th	Relation between –(i) Linear & Angular velocity, (ii) Linear & Angular acceleration)
4th	1st	Define Projectile, Examples of Projectile.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.
	2nd	WORK AND FRICTION Work – Definition, Formula & SI units.
	3rd	4.2 Friction – Definition & Concept.
	4th	4.3 Types of friction (static, dynamic), Limiting Friction (Definition with Concept).
5th	1st	4.4 Laws of Limiting Friction (Only statement, No Experimental Verification
	2nd	Coefficient of Friction – Definition & Formula, Simple Numericals. Methods to reduce friction.
	3rd	UNIT 5 - GRAVITATION
	4th	Newton's Laws of Gravitation – Statement and Explanation.
6th	1st	Universal Gravitational Constant (G)- Definition, Unit and Dimension. Acceleration due to gravity (g)- Definition and Concept
	2nd	Definition of mass and weight. Relation between g and G.Variation of g with altitude and depth (No derivation – Only Explanation)
	3rd	UNIT 6 - OSCILLATIONS AND WAVES
	4th	6.1 Simple Harmonic Motion (SHM) - Definition & Examples.
7th	1st	. 6.2 Expression (Formula/Equation) for displacement, velocity, acceleration of a body/ particle in SHM.

	2nd	6.3. Wave motion – Definition & Concept 6.4 Transverse and Longitudinal wave motion – Definition, Examples & Comparison.
	3rd	6.5 Definition of different wave parameters (Amplitude, Wavelength, Frequency, Time Period.
	4th	6.6 Derivation of Relation between Velocity, Frequency and Wavelength of a wave. Ultrasonic – Definition, Properties & Applications.
8th	1st	- HEAT AND THERMODYNAMICS 7.1 Heat and Temperature – Definition & Difference
	2nd	7.2 Units of Heat (FPS, CGS, MKS & SI). 7.3 Specific Heat (concept, definition, unit, dimension and simple numerical)
	3rd	7.4 Change of state (concept), Latent Heat (concept, definition, unit, dimension and simple numerical)
	4th	7.5 Thermal Expansion – Definition & Concept 7.6 Expansion of Solids (Concept)
9th	1st	7.7 Coefficient of linear, superficial and cubical expansions of Solids – Definition & Units.
	2nd	7.8 Relation between α, β & γ 7.9 Work and Heat - Concept & Relation.
	3rd	7.10 Joule's Mechanical Equivalent of Heat (Definition, Unit) 7.11 First Law of Thermodynamics (Statement and concept only).
	4th	OPTICS 8.1 Reflection & Refraction – Definition. 8.2 Laws of reflection and refraction (Statement only)).
10th	1st	8.3 Refractive index – Definition, Formula &Simple numerical. 8.4 Critical Angle and Total internal reflection – Concept, Definition & Explanation
	2nd	8.5 Refraction through Prism (Ray Diagram & Formula only – NO derivation
	3rd	8.6 Fiber Optics – Definition, Properties & Applications.
	4th	9. ELECTROSTATICS & MAGNETOSTATICS
11th	1st	9.1 Electrostatics – Definition & Concept. 9.2 Statement & Explanation of Coulombs laws, Definition of Unit charge.
	2nd	9.3 Absolute & Relative Permittivity (ε) – Definition, Relation & Unit. 9.4 Electric potential and Electric Potential difference (Definition, Formula & SI Units).

		3rd	9.5 Electric field, Electric field intensity (E) – Definition, Formula & Unit. 9.6 Capacitance - Definition, Formula & Unit.
		4th	9.7 Series and Parallel combination of Capacitors (No derivation, Formula for effective/Combined/total capacitance & Simple numericals).
12th		1st	9.8 Magnet, Properties of a magnet 9.9 Coulomb's Laws in Magnetism – Statement & Explanation, Unit Pole (Definition).
		2nd	9.10 Magnetic field, Magnetic Field intensity (H) - (Definition, Formula & SI Unit). 9.11 Magnetic lines of force (Definition and Properties) 9.12 Magnetic Flux (Φ) & Magnetic Flux Density (B) – Definition, Formula & Unit.
		3rd	CURRENT ELECTRICITY 10.1 Electric Current – Definition, Formula & SI Units.
		4th	10.2 Ohm's law and its applications.
13th		1st	10.3 Series and Parallel combination of resistors (No derivation, Formula for effective/ Combined/ total resistance & Simple numericals).
		2nd	10.4 Kirchhoff's laws (Statement & Explanation with diagram).
		3rd	10.5 Application of Kirchhoff's laws to Wheatstone bridge - Balanced condition of Wheatstone's Bridge – Condition of Balance (Equation).
		4th	ELECTROMAGNETISM & ELECTROMAGNETIC INDUCTION 11.1Electromagnetism – Definition & Concept.
14th		1st	11.2 Force acting on a current carrying conductor placed in a uniform magnetic field, Fleming's Left Hand Rule
		2nd	11.3 Faraday's Laws of Electromagnetic Induction (Statement only)
		3rd	11.4 Lenz's Law (Statement)
		4th	11.5 Fleming's Right Hand Rule
15th		1st	11.6 Comparison between Fleming's Right Hand Rule and Fleming's Left Hand Rule.
		2nd	UNIT 12 - MODERN PHYSICS 12.1 LASER & laser beam (Concept and Definition) 12.2 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)