

Lesson Plan

Discipline: Electrical & Mechanical , Semester: 2 nd , Name of Faculty : Jiten Mishra		
Subject: Engg. Physics	No. of days/ week Class allotted: 4	Semester From Date: 01-02-2024 To date : 14-05-2024
Week	Class Day	Theory
1st		<u>UNITS & DIMENSIONS</u>
	1st	Introduction 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.
2nd	4th	<u>SCALARS & VECTORS</u> Scalar and Vector quantities (definition and concept), Representation of a Vector – examples, types of vectors.
	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	<u>KINEMATICS</u> Concept of Rest and Motion. Displacement, Speed, Velocity,
3rd	4th	Acceleration & FORCE (Definition, formula, dimension & SI units). Equations of Motion under Gravity (upward and downward motion) - no derivation.
	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	4th	Time of Flight, Maximum Height and Horizontal Range for a projectile fired at an angle, Condition for maximum Horizontal Range.
	1st	<u>WORK & FRICTION</u> Work – Definition, Formula & SI units.
	2nd	Friction – Definition & Concept.
	3rd	Types of friction (static, dynamic), Limiting Friction (Definition with Concept).
5th	4th	Laws of Limiting Friction (Only statement, No Experimental Verification). Coefficient of Friction – Definition & Formula, Simple Numericals.
	1st	Methods to reduce friction.
	2nd	<u>GRAVITATION</u> 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.
6th	4th	Definition of mass and weight. Relation between g and G.
	1st	Variation of g with altitude and depth (No derivation – Only Explanation).
	2nd	Kepler's Laws of Planetary Motion (Statement only).

	3rd	<u>OSCILLATIONS & WAVES</u> 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	<u>HEAT & THERMODYNAMICS</u> 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 & γ
	2nd	Work and Heat - Concept & Relation. Joule's Mechanical Equivalent of Heat (Definition, Unit)
	3rd	First Law of Thermodynamics (Statement and concept only)
	4th	<u>OPTICS</u> 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	<u>ELECTROSTATICS & MAGNETOSTATICS</u> 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	<u>CURRENT ELECTRICITY</u> 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	<u>ELECTROMAGNETISM & ELECTROMAGNETIC INDUCTION</u> 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	<u>MODERN PHYSICS</u> 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 REFERENCE:

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

Sd/-
HOD
Dept. of Math & Sc.
Govt. Polytechnic Kandhamal
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