GANAPATI INSTITUTE OF ENGINEERING AND TECHNOLOGY , JAGATPUR
CUTTACK

DEPARTMENT: MATH AND SCIENCE

LESSON PLAN

By

Mrs. Sobhana Samarpita panda

ACADEMIC SESSION:-2025- 2026

SEMESTER: -1st SEMESTER, WINTER (2025)

SUBJECT:- APPLIED PHYSICS-I (THEORY-2)

(COMMON FOR ALL BRANCHES)

Discipline: Civil +Electrical + Etc + Mechanical + Comp.sc	Semester: 1st Semester	Name of the Teaching Faculty: Sobhana Samarpita Panda
Subject: APPLIED PHYSICS- I	No. of Days/ per week class allotted: 04 periods/per week	Semester From: -Date: 06/08/2025 to 06/12/2025 No of Weeks: - 18
Week		**Theory Topics**
1st	1st	Introduction and syllabus discussion **Unit-1: Physical World, Units and Measurements**
	2nd	Physical quantities; fundamental and derived Units and systems of units (FPS,CGS and SI units)
	3rd	Describe different physical quantity and their SI units
2nd	1st	Dimensions and dimensional formulae of physical quantities, Principle of homogeneity of dimensions
	2nd	Dimensional equations and their applications(conversion from one system of units to other, checking of dimensional equations and derivation of simple equation)
	3rd	Checking of dimensional equations and derivation of simple equations.
3rd	1st	Limitations of dimensional analysis
	2nd	Measurements: Need, measuring instruments
	3rd	Least count, types of measurements(direct, indirect) Errors in measurements (systematic and random)
4th	1st	Absolute error, relative error, error propagation
	2nd	Error estimation ,Significant figures
	3rd	Simple numerical on dimension and error
	4th	**CLASS TEST-1**
5th	1st	**Unit-2: Force and Motion** Scalar and vector quantities-examples, representation of vector.
	2nd	Types of vectors.
	3rd	Addition and subtraction of vectors , triangle and parallelogram law (statement only)
	4th	Simple problems discussed
6th	1st	Scalar and vector product.
	2nd	Resolution of vector and its application to inclined plane and lawn roller.
	3rd	Force, momentum. ,Newton's Laws of motion Statement and derivation of conservation of linear

		rockets, impulse and its applications.
7th	1st	Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period.
	2nd	Relation between linear and angular velocity, linear acceleration and angular acceleration(related numerical)
	3rd	Centripetal and centrifugal forces with live examples.
	4th	Expression and applications such as banking of roads and bending of cyclist.
8th	1st	**CLASS TEST-2**
	2nd	**Unit-3: Work, Power and Energy** Work: concept and units, examples of zero work, positive work and negative work.
	3rd	Friction: concept, types, laws of limiting friction.
	4th	Coefficient of friction, reducing friction and its engineering applications.
9th	1st	Work done in moving an object on horizontal and inclined plane for rough and plane surfaces and related applications.
	2nd	Energy and its units, kinetic energy, gravitational potential energy with examples and derivations.
	3rd	Mechanical energy, conservation of mechanical energy for freely falling bodies, transformation of energy (examples).
	4th	Power and its units , power and work relationship, calculation of power (numerical problem)
10th	1st	**CLASS TEST-3**
	2nd	**Unit-4: Rotational Motion** Translational and rotational motions with examples.
	3rd	Definition of torque and angular momentum and their applications.

11th	1st	Radius of gyration for rigid body, theorems of parallel and perpendicular axes (statement only)
	2nd	Moment of inertia of rod, disc, ring and sphere (hollow and solid): (formulae only)
	3rd	**CLASS TEST-4**
12th	1st	**Unit- 5: Properties of Matter** Elasticity: definition of stress and strain.
	2nd	Moduli of elasticity, Hooke's law, significance of stressstrain curve.
	3rd	Pressure: definition ,units, atmospheric pressure, gauge pressure, absolute pressure.
	4th	Fortin's Barometer and its applications.
13th	1st	Surface tension: concept , units, cohesive and adhesive forces.
	2nd	Angle of contact, ascent formula (no derivation), applications of surface tension.
	3rd	Viscosity and coefficient of viscosity: Terminal velocity ,Stoke's law and effect of temperature on viscosity. Application in hydraulic systems.
	4th	Hydrodynamics: fluid motion, stream line and turbulent flow, Reynold's number Equation of continuity, Bernoulli's theorem(only formula and numerical) and its applications.
14th	1st	**CLASS TEST-5**
	2nd	**Unit-6 : Heat and Thermometry** Concept of heat and temperature, modes of heat transfer
	3rd	(conduction, convection and radiation with examples)
	4th	Specific heats, scales of temperature and their relationship, Types of Thermometer (Mercury thermometer, Bimetallic thermometer, Platinum resistance thermometer, Pyrometer) and their uses.
	1st	Expansion of solids, liquids and gases, coefficient of linear, surface and cubical expansions and relation amongst them.

15th	2nd	Co-efficient of thermal conductivity, engineering applications.
	3rd	CLASS TEST-6
16th	1st	REVISION AND DOUBT CLEARING
	2nd	Previous year question discussion
	3rd	Sample paper discussion
17th	1st	Dout clearing
	2nd	Problem solving
	3rd	Some question and answer discussion
	4th	CLASS TEST- 7
18TH	1st	REVISION
	2nd	REVISION

REFERENCE BOOK:

1. Concepts in physics by H.C. Verma.
2. APPLIED PHYSICS-I by Prof. Vinod Kumar Yadav
3. Test book of physics for class XI & XII: N.C.E.R.T

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