Lesson Plan For Applied Physics

Discipline: Common to all branch		**Semester: 1st , Name of Faculty : Mrs .Sthitipragyan Paramita Nath**
Subject: Applied Physics - I	**No. of days per week Class allotted:** 4	**Semester From Date:** 06-08-2025 **To date :** 04-12-2025

Week	Class Day	Theory
1st	1st	Introduction to the Subject, Syllabus and Course Outcomes
	2nd	**Unit 1: Physical world, Units and Measurements** Physical quantities; fundamental and derived,
	3rd	Units and systems of units (FPS, CGS and SI units),
	4th	Dimensions and dimensional formulae of physical quantities,
2nd	1st	Principle of homogeneity of dimensions,
	2nd	Dimensional equations and their applications (conversion from one system of units to other,
	3rd	checking of dimensional equations and derivation of simple equations), Limitations of dimensional analysis.
	4th	Measurements: Need, measuring instruments, least count,
3rd	1st	types of measurement (direct, indirect), Errors in measurements (systematic and random)
	2nd	absolute error, relative error, error propagation,
	3rd	error estimation and significant figures
4th	1st	**Unit 2: Force and Motion** Scalar and Vector quantities – examples, representation of vector, types of vectors.
	2nd	Addition and Subtraction of Vectors
	3rd	Triangle and Parallelogram law (Statement only), Scalar and Vector Product,
5th	1st	Resolution of a Vector and its application to inclined plane and lawn roller.
	2nd	Force, Momentum, Statement and derivation of conservation of linear momentum,
	3rd	its applications such as recoil of gun, rockets, Impulse and its applications.
	4th	Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period,
6th	1st	Relation between linear and angular velocity, linear acceleration and angular acceleration (related numerical)
	2nd	Centripetal and Centrifugal forces with live examples,
	3rd	Expression and applications such as banking of roads and bending of cyclist.
	4th	**Unit 3: Work, Power and Energy** Work: Concept and units, examples of zero work, positive work and negative work
7th	1st	Friction: concept, types,
	2nd	laws of limiting friction, coefficient of friction, reducing friction and its engineering applications,
	3rd	**CLASS TEST 1**
	4th	Workdone in moving an object on horizontal and inclined plane for rough and plane surfaces and related applications.
8th	1st	Energy and its units, kinetic energy, gravitational potential energy with examples and derivations, mechanical energy,
	2nd	conservation of mechanical energy for freely falling bodies, trans-formation of energy (examples).
	3rd	Power and its units, power and work relationship, calculation of power (numerical problems).

Week	Class Day	Theory
	4th	**Unit 4: Rotational Motion** Translational and rotational motions with examples,
9th	1st	Definition of torque and angular momentum and their examples,
	2nd	**2ND INTERNAL**
	3rd	Conservation of angular momentum (quantitative) and its applications.
	4th	Moment of inertia and its physical significance,
10th	1st	radius of gyration for rigid body,
	2nd	Theorems of parallel and perpendicular axes (statements only),
	3rd	Moment of inertia of rod, disc, ring and sphere (hollow and solid); (Formulae only)
	4th	**Unit 5: Properties of Matter Elasticity**: definition of stress and strain, moduli of elasticity,
11th	1st	Hooke's law, significance of stress-strain curve
	2nd	**CLASS TEST 2**
	3rd	Pressure: definition, units, atmospheric pressure, gauge pressure,
	4th	absolute pressure, Fortin's Barometer and its applications.
12th	1st	Surface tension: concept, units, cohesive and adhesive forces, angle of contact, Ascent Formula (No derivation),
	2nd	applications of surface tension, effect of temperature and impurity on surface tension.
	3rd	Viscosity and coefficient of viscosity: Terminal velocity,
	4th	**Stoke's law and effect of temperature on viscosity, application in hydraulic systems.**
13th	1st	Hydrodynamics: Fluid motion, stream line and turbulentflow,
	2nd	Reynold's number Equation of continuity,
	3rd	Bernoulli's Theorem (only formula and numericals) and its applications.
	4th	**Unit 6: Heat and Thermometry** Concept of heat and temperature,
14th	1st	modes of heat transfer (conduction, convection and radiation with examples),
	2nd	specific heats, scales of temperature and their relationship,
	3rd	Types of Thermometer (Mercury thermometer, Bimetallic thermometer, Platinum resistance thermometer, Pyrometer) and their uses.
	4th	Expansion of solids, liquids and gases, coefficient of linear, surface and cubical expansions and relation amongst them
15th	1st	, Co-efficient of thermal conductivity, engineering applications.
	2nd	Revision
	3rd	Revision
	4th	Revision

BOOK REFERNCE:

1 Applied Physics-II by Prof. Hussain Jeevakhan

2 Text Book of Physics for Class XII(Part-I, Part-II); N.C.E.R.T., Delhi

3 Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi

Concerned faculty:

Mrs. Sthitiprangya Paramita Nath , Guest faculty in Physics