

LESSON PLAN

Discipline : ELECTRICAL ENGG.	Semester : 1ST	Name of the Teaching Faculty: SOVAKARA SING, ANJALI KUJUR & ABINASH NANDI
Subject: APPLIED PHYSICS-I	No. of days/per week class allotted: 04	Semester from date 06.08.2025 to 04.12.2025 No. of Weeks: 15

Week	Class day	Theory/ Practical Topics
1st	1st	Physical quantities; fundamental and derived, Units and systems of units (FPS, CGS and SI units)
	2nd	Dimensions and dimensional formulae of physical quantities, Principle of homogeneity of dimensions, Dimensional equations
	3rd	Applications of Dimensional analysis (conversion from one system of units to other)
	4th	Applications of Dimensional analysis (checking of dimensional equations)
2nd	1st	Applications of Dimensional equations (derivation of simple equations), Limitations of dimensional analysis.
	2nd	Measurements: Need, measuring instruments, least count, types of measurement (direct, indirect),
	3rd	Errors in measurements (systematic and random), absolute error, relative error, error propagation, error estimation and significant figures.
	4th	Scalar and Vector quantities – examples, representation of vector, types of vectors.
3rd	1st	Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only),
	2nd	Scalar Product
	3rd	Vector Product
	4th	Resolution of a Vector and its application to inclined plane and lawn roller.
4th	1st	Force, Momentum, Statement and derivation of conservation of linear momentum
	2nd	Applications of conservation of linear momentum such as recoil of gun, rockets, Impulse and its applications.
	3rd	Circular motion, definition of angular displacement, angular velocity, angular acceleration,
	4th	frequency, time period, Relation between linear and angular velocity, linear acceleration and angular acceleration (related numerical),
5th	1st	Centripetal and Centrifugal forces with live examples,
	2nd	Expression and applications such as banking of roads and bending of cyclist.
	3rd	Work: Concept and units, examples of zero work, positive work and negative work
	4th	Friction: concept, types,

Week	Class day	Theory/ Practical Topics
6th	1st	laws of limiting friction, coefficient of friction, reducing friction and its engineering applications
	2nd	Work done in moving an object on horizontal plane
	3rd	Work done in moving an object on inclined plane for rough and plane surfaces and related applications.
	4th	Energy and its units, kinetic energy
7th	1st	gravitational potential energy with examples and derivations,
	2nd	mechanical energy, conservation of mechanical energy for freely falling bodies, transformation of energy (examples).
	3rd	Power and its units, power and work relationship, calculation of power (numerical problems).
	4th	Translational and rotational motions with examples
8th	1st	Definition of torque and angular momentum and their examples,
	2nd	Conservation of angular momentum (quantitative) and its applications
	3rd	Moment of inertia and its physical significance (Relation of torque and moment of inertia, Relation of angular momentum and moment of inertia)
	4th	radius of gyration for rigid body
9th	1st	Theorems of parallel and perpendicular axes (statements only),
	2nd	Moment of inertia of rod, disc, ring and sphere (hollow and solid); (Formulae only).
	3rd	Elasticity: definition of stress and strain
	4th	moduli of elasticity, Hooke's law,
10th	1st	significance of stress-strain curve.
	2nd	Pressure: definition, units, atmospheric pressure
	3rd	gauge pressure, absolute pressure, Fortin's Barometer and its applications.
	4th	Surface tension: concept, units
11th	1st	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
	4th	Terminal velocity
12th	1st	Stoke's law and effect of temperature on viscosity
	2nd	application in hydraulic systems.
	3rd	Hydrodynamics: Fluid motion
	4th	stream line and turbulent flow
13th	1st	Reynold's number & Equation of continuity
	2nd	Bernoulli's Theorem (only formula and numerical) and its applications
	3rd	Concept of heat and temperature
	4th	modes of heat transfer (conduction, convection and radiation with examples)

Week	Class day	Theory/ Practical Topics
14th	1st	specific heats
	2nd	scales of temperature and their relationship
	3rd	Types of Thermometer :-Mercury thermometer, Bimetallic thermometer &
	4th	Platinum resistance thermometer, Pyrometer and uses thermometers.
15th	1st	Expansion of solids, liquids and gases, coefficient of linear, surface and cubical expansions
	2nd	Relation between coefficient of linear & surface expansion
	3rd	Relation between coefficient of linear & cubical expansion, relation amongst them
	4th	Co-efficient of thermal conductivity, engineering applications

1. Text Book of Physics for Class XI (Part-I, Part-II) N.C.E.R.T
2. Text Book of Physics for Class XII (Part-I, Part-II) N.C.E.R.T
3. Text Book of Engineering Physics by Barik, Das, Sharma, Kalyani Publisher
4. Concepts in Physics by H. C. Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
5. J. Walker, Principle of Physics, 9th Edition, Hoboken, New Jersey: Wiley-2011
6. M.E. Browne, Schaum's outline of Physics for Engineering and Science, 4th Edition, McGraw-Hill, 2019