BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

DEPARTMENT: HUMANITIES AND SCIENCE

LESSON PLAN

By

Mr. PRADOSH KUMAR GAJENDRA

ACADEMIC SESSION:-2024-25

SEMESTER: -1st SEMESTER, WINTER (2024)

SUBJECT:- APPLIED PHYSICS-I (THEORY)

SECTION- C

Discipline: Electrical (SEC-C)	**Semester:** 1st Semester	**Name of the Teaching Faculty:** PRADOSH KUMAR GAJENDRA
Subject: APPLIED PHYSICS I	**No. of Days/ per week class allotted:** 04 periods/per week (Mon, Tue, Thu,Sat)	**Semester From: -**Date: 16 / 08 / 2024 to10/ 12/2024 **No of Weeks: -** 18
Week	**Class Dates**	**Theory Topics**
1st	**17.08.24**	Introduction and syllabus discussion **Unit-1: Physical World, Units and Measurements** Physical quantities; fundamental and derived Units and systems of units (FPS,CGS and SI units)
2nd	**20.08.24**	Dimensions and dimensional formulae of physical quantities, Principle of homogeneity of dimensions
	22.08.24	Dimensional equations and their applications(conversion from one system of units to other, checking of dimensional equations and derivation of simple equation)
	24.08.24	Checking of dimensional equations and derivation of simple equations.
3rd	**27.09.24**	Limitations of dimensional analysis
	29.09.24	Measurements: Need, measuring instruments
	31.09.24	Least count, types of measurements(direct, indirect) Errors in measurements (systematic and random)
4th	**02.09.24**	Absolute error, relative error, error propagation
	03.09.24	Error estimation ,Significant figures
	05.09.24	**CLASS TEST-1**
5th	**10.09.24**	**Unit-2: Force and Motion** Scalar and vector quantities-examples, representation of vector.
	12.09.24	Types of vectors.
	14.09.24	Addition and subtraction of vectors , triangle and parallelogram law (statement only)
6th	**17.09.24**	Scalar and vector product.

	19.09.24	Resolution of vector and its application to inclined plane and lawn roller.
	21.09.24	Force , momentum. Statement and derivation of conservation of linear momentum, its applications such as recoil of gun, rockets, impulse and its applications.
7th	**23.09.24**	Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period.
	24.09.24	Relation between linear and angular velocity, linear acceleration and angular acceleration(related numerical)
	26.09.24	Centripetal and centrifugal forces with live examples.
	28.09.24	Expression and applications such as banking of roads and bending of cyclist.
8th	**30.09.24**	**CLASS TEST-2**
	01.10.24	**Unit-3: Work, Power and Energy** Work: concept and units, examples of zero work, positive work and negative work.
	03.10.24	Friction: concept, types, laws of limiting friction.
	05.10.24	Coefficient of friction, reducing friction and its engineering applications.
9th	**14.10.24**	Work done in moving an object on horizontal and inclined plane for rough and plane surfaces and related applications.
	15.10.24	Energy and its units, kinetic energy, gravitational potential energy with examples and derivations.
	17.10.24	Mechanical energy, conservation of mechanical energy for freely falling bodies, transformation of energy (examples).
	19.10.24	Power and its units , power and work relationship, calculation of power (numerical problem)
10th	**21.10.24**	**CLASS TEST-3**

	22.10.24	**Unit-4: Rotational Motion** Translational and rotational motions with examples.
	24.10.24	Definition of torque and angular momentum and their applications.
	26.10.24	Moment of inertia and its physical significance.
11th	**28.10.24**	Radius of gyration for rigid body, theorems of parallel and perpendicular axes (statement only)
	29.10.24	Moment of inertia of rod, disc, ring and sphere (hollow and solid): (formulae only)
	02.11.24	**CLASS TEST-4**
12th	**04.11.24**	**Unit- 5: Properties of Matter** Elasticity: definition of stress and strain.
	05.11.24	Moduli of elasticity, Hooke's law, significance of stress-strain curve.
	07.11.24	Pressure: definition ,units, atmospheric pressure, gauge pressure, absolute pressure.
	09.11.24	Fortin's Barometer and its applications.
13th	**11.11.24**	Surface tension: concept , units, cohesive and adhesive forces.
	12.11.24	Angle of contact, ascent formula (no derivation), applications of surface tension.
	14.11.24	Viscosity and coefficient of viscosity: Terminal velocity ,Stoke's law and effect of temperature on viscosity. Application in hydraulic systems.
	16.11.24	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	**18.11.24**	**CLASS TEST-5**
	19.11.24	**Unit-6 : Heat and Thermometry** Concept of heat and temperature, modes of heat transfer

		(conduction, convection and radiation with examples)
	21.11.24	Specific heats, scales of temperature and their relationship, Types of Thermometer (Mercury thermometer, Bimetallic thermometer, Platinum resistance thermometer, Pyrometer) and their uses.
	23.11.24	Expansion of solids, liquids and gases, coefficient of linear, surface and cubical expansions and relation amongst them.
15th	**25.11.24**	Co-efficient of thermal conductivity, engineering applications.
	26.11.24	**CLASS TEST-6**
16th	**28.11.24**	**REVISION AND DOUBT CLEARING**
	30.11.24	**VST**
17th	**02.12.24**	**VST**
	03.12.24	**VST**
	05.12.24	**VST**
	07.12.24	**VST**
18TH	**09.12.24**	**VST**
	10.12.24	**VST**

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