LESSON PLAN FOR APPLIED PHYSICS-I (Th-2)

Discipline: All Branches	Semester: 1st Sem (2024 A.B)		Name of teaching faculty: Ms. Sushree Sangita Satapathy & Mr. Jyotiranjan Dash
Subject: Applied Physics-I	No. of days/ Per week class allotted: 4		Date of commencement: 10/09/2024 To: 24/12/24
Week	Class day	Unit	Theory topics
1	1	1	Physical quantities; fundamental and derived, Units and systems of units (FPS, CGS and SI units)
	2		Dimensions and dimensional formulae of physical quantities
	3		Principle of homogeneity of dimensions, Dimensional equations and their applications
	4		Conversion from one system of units to other
2	1		Checking of dimensional equations
	2		Derivation of simple equations, Limitations of dimensional analysis
	3		Measurements: Need, measuring instruments, least count, types of measurement (direct, indirect)
	4		Errors in measurements (systematic and random)
3	1		Absolute error, relative error, error estimation
	2		Error propagation, and significant figures
	3	2	Scalar and Vector quantities – examples, representation of vector, Types of vectors
	4		Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only)
4	1		Scalar and Vector Product
	2		Resolution of a Vector and its application to inclined plane and lawn roller
	3		Force, Momentum, Statement & derivation of conservation of linear momentum
	4		Its applications such as recoil of gun, rockets, Impulse and its applications.
5	1		Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period
	2		Relation between linear and angular velocity, linear acceleration and angular acceleration (related numerical)
	3		Centripetal and Centrifugal forces with live examples
	4		Expression and applications such as banking of roads and bending of cyclist
6	1	3	Work: Concept and units, examples of zero work, positive work and negative work
	2		Friction: concept, types
	3		Laws of limiting friction, coefficient of friction
	4		Reducing friction and its engineering applications
7	1		Work done in moving an object on horizontal and inclined plane for rough and plane surfaces and related applications

Week	Period	Unit	Topic
	2		Energy and its units, kinetic energy, gravitational potential energy with examples and derivations
	3		Mechanical energy, conservation of mechanical energy for freely falling bodies, transformation of energy (examples)
	4		Power and its units, power and work relationship
8	1		Calculation of power (numerical problems)
	2		Translational and rotational motions with examples
	3		Definition of torque and angular momentum and their examples
	4	4	Conservation of angular momentum (quantitative) and its applications
9	1		Moment of inertia and its physical significance, radius of gyration for rigid body
	2		Theorems of parallel and perpendicular axes (statements only)
	3		Moment of inertia of rod, disc, ring and sphere (hollow and solid); (Formulae only)
	4		Elasticity: definition of stress and strain
10	1		Moduli of elasticity, Hooke's law
	2		Significance of stress-strain curve
	3		Pressure: definition, units, atmospheric pressure, gauge pressure
	4	5	Absolute pressure, Fortin's Barometer and its applications
11	1		Surface tension: concept, units, cohesive and adhesive forces
	2		Angle of contact, Ascent Formula (No derivation), applications of surface tension
	3		Viscosity and coefficient of viscosity: Terminal velocity
	4		Stoke's law and effect of temperature on viscosity, application in hydraulic systems.
12	1		Hydrodynamics: Fluid motion, stream line and turbulent flow
	2		Reynold's number Equation of continuity
	3		Bernoulli's Theorem (only formula and numericals) and its applications
	4	6	Concept of heat and temperature
13	1		Modes of heat transfer (conduction, convection and radiation with examples)
	2		Specific heats, scales of temperature and their relationship
	3		Types of Thermometer (Mercury thermometer, Bimetallic thermometer, Platinum resistance thermometer, Pyrometer) and their uses
	4		Expansion of solids, liquids and gases
14	1		Coefficient of linear, surface and cubical expansions and relation amongst them
	2		Co-efficient of thermal conductivity, engineering applications
	3		Revision of Chapter-1:
	4		Revision of Chapter-2:
15	1		Revision of Chapter-3:
			Revision of Chapter-4:

2		
3		Revision of Chapter-5:
4		Revision of Chapter-6:

S. Satapathy