GOVERNMENT POLYTECHNIC, BARGARH

DEPARTMENT OF MATHEMATICS & SCIENCES

LESSON PLAN

Semester – 1st **Subject – Applied Physics-I**

Branch – CE/ME/EE/EEE/CSE **Name of the faculty – R. K. Pardia**

UNIT	CLASS	THEORY TOPIC
UNIT-1	1	Physical quantities (Definition), fundamental & derived Quantity
	2	Units and systems of units (FPS, CGS and SI units), Dimensions and dimensional formulae
	3	Dimensions and dimensional formulae of physical quantities, Principle of homogeneity of dimensions
	4	Dimensional equations and their applications
	5	Conversion from one system of units to other, checking of dimensional equations
	6	Derivation of simple equations and problems
	7	Dimensional equations and their applications, Limitations of dimensional analysis
	8	Measurements: Need, measuring instruments, least count, types of measurement (direct, indirect), Errors in measurements (systematic and random)
	9	absolute error, relative error, error propagation, error estimation and significant figures
	10	UNIT DISCUSSION
UNIT-2	11	Scalar and Vector quantities – examples, representation of vector, types of vectors
	12	Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only)
	13	Scalar and Vector Product
	14	Resolution of a Vector and its application to inclined plane and lawn roller
	15	UNIT DISCUSSION
	16	Force, Momentum, Statement and derivation of conservation of linear momentum
	17	its applications such as recoil of gun, rockets, Impulse and its applications.
	18	Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period
	19	Relation between linear and angular velocity, linear acceleration and angular acceleration (related numerical)
	20	Centripetal and Centrifugal forces with live examples
	21	Expression and applications such as banking of roads and bending of cyclist
	22	UNIT DISCUSSION
UNIT-3	23	Work: Concept and units, examples of zero work, positive work and negative work
	24	Friction: concept, types, laws of limiting friction
	25	coefficient of friction, reducing friction and its engineering applications
	26	Work done in moving an object on horizontal and inclined plane for rough and plane surfaces and related applications

	27	Energy and its units, kinetic energy, gravitational potential energy with examples and derivations
	28	Mechanical energy, conservation of mechanical energy for freely falling bodies, trans-formation of energy (examples)
	29	gravitational potential energy with examples and derivations
	30	Power and its units, power and work relationship
	31	calculation of power (numerical problems)
	32	UNIT DISCUSSION
UNIT-4	33	Translational and rotational motions with examples
	34	Definition of torque and angular momentum and their examples
	35	Conservation of angular momentum (quantitative) and its applications
	36	Moment of inertia and its physical significance
	37	Radius of gyration for rigid body, Theorems of parallel and perpendicular axes (statements only)
	38	Moment of inertia of rod, disc, ring and sphere (hollow and solid); (Formulae only)
	39	UNIT DISCUSSION
UNIT-5	40	Elasticity: definition of stress and strain, moduli of elasticity
	41	Hooke's law, significance of stress-strain curve
	42	Pressure: definition, units, atmospheric pressure, gauge pressure
	43	Absolute pressure, Fortin's Barometer and its applications
	44	Surface tension: concept, units, cohesive and adhesive forces, angle of contact, Ascent Formula (No derivation)
	45	Applications of surface tension, effect of temperature and impurity on surface tension
	46	Viscosity and coefficient of viscosity: Terminal velocity
	47	Stoke's law and effect of temperature on viscosity, application in hydraulic systems
	48	Hydrodynamics: Fluid motion, stream line and turbulent flow
	49	Reynold's number, Equation of continuity
	50	Bernoulli's Theorem (only formula and numerical) and its applications
	51	UNIT DISCUSSION
UNIT-6	52	Concept of heat and temperature, modes of heat transfer (conduction, convection and radiation with examples)
	53	Specific heats, scales of temperature and their relationship
	54	Types of Thermometers (Mercury thermometer, Bimetallic thermometer) and their uses
	55	Platinum resistance thermometer, Pyrometer
	56	Expansion of solids, liquids and gases
	57	coefficient of linear, surface and cubical expansions
	58	Relationship between α, β, γ
	59	Co-efficient of thermal conductivity, engineering applications.
	60	UNIT DISCUSSION