JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA

DEPARTMENT OF MATHEMATICS & SCIENCE

LESSON PLAN

NAME OF THE FACULTY:- BABITA PADHI & RITIKA DASH

COURSE NAME:- ENGINEERING PHYSICS

COURSE CODE:- TH-2A

DURATION:- 60MINS

SESSION:- WINTER

ACADEMIC YEAR:- 2024-25

BRANCH:- ALL BRANCHES T(a)

SECTION:- C, M(a),M(b),E, IT,ETC, comp, MCT

SEMESTER:- 1ST (1st year) T(b)

WEEK	PERIOD	TOPIC TO BE COVERED
1.	1.	**UNITS AND DIMENSIONS:** Physical quantities; fundamental and derived physical quantities.
	2.	Units and systems of units (FPS, CGS and SI units).
	3.	Dimensions and dimensional formulae of physical quantities,
	4.	Principle of homogeneity of dimensions, Dimensional equations and their applications((conversion from one system of units to other)
	5.	Checking the correctness of dimensional equations.
	6.	Derivation of simple equations), Limitations of dimensional analysis.
	7.	Measurements: Need, measuring instruments, least count.
	8.	Types of measurement (direct, indirect),
	9.	Errors in measurements (systematic and random), absolute error, relative error,
	10.	Error propagation, error estimation and significant figures.
2.	11.	**FORCE AND MOTION :** 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.	Force, Momentum, Statement and derivation of conservation of linear momentum
	16.	Its applications such as recoil of gun, rockets, Impulse and its applications
	17.	Circular motion, definition of angular displacement, angular velocity, angular acceleration,
	18.	Frequency, time period, Relation between linear and angular velocity, linear acceleration and angular acceleration
	19.	Related numerical, Centripetal and Centrifugal forces with live examples.
	20.	Expression and applications such as banking of roads and bending of cyclist.
3.	21.	**WORK, POWER AND ENERGY :** Work: Concept and units, examples of zero work, positive work and negative work.
	22.	Friction: concept, types, laws of limiting friction.
	23.	Coefficient of friction, reducing friction and its engineering applications.
	24.	Work done in moving an object on horizontal plane for rough and plane surfaces.
	25.	Work done in moving an object inclined plane for rough and plane surfaces and related applications.

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

Signature of faculty member

Signature of Sr. Lecturer
Sr. Lect.(M/Sc)
Engg. School
Jharsuguda