

**GOVERNMENT POLYTECHNIC NAYAGARH**  
**LESSON PLAN-2025 (W); AY :2025-26**

Discipline: Civil Engg./Comp.Sc. Engg.	Semester:1ST	Name of the Teaching Faculty : Ms. SUCHANA SARANGI, Sr. Lect. Physics
Subject: Applied Physics-I (Th. 2)	No. of days/ per week class allotted: 4	Semester From Date :06/08/2025 to Date: 04/12/2025 No. of Weeks: 15
Week	Class Day	Theory Topics
1st	1st	<b>Unit1:</b> Physical world, Units and Measurements Physical quantities : fundamental and derived. Units and systems of units (FPS, CGS and SI units) Dimensions and dimensional formulae of physical quantities, Principle of homogeneity of dimensions (Dimensional equations and their applications (conversion from one system of units to other) checking of dimensional equations and derivation of simple equations), Limitations of dimensional analysis
	2nd	
	3rd	
	4th	
2nd	1st	<b>Measurements:</b> Need, measuring instruments, least count, types of measurement (direct, indirect) Errors in measurements (systematic and random), absolute error, relative error error propagation, error estimation and significant figures Numericals of Unit 1
	2nd	
	3rd	
	4th	
3rd	1st	<b>Unit 2: Force and Motion</b> Scalar and Vector quantities- examples representation of vector, types of vectors Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only) Scalar and Vector Product Resolution of a Vector and its application to inclined plane and lawn roller
	2nd	
	3rd	
	4th	
4th	1st	Force, Momentum, Statement and derivation of conservation of linear momentum, its applications such as recoil of gun, rockets, impulse and its applications Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period Relation between linear and angular velocity, linear Acceleration and angular acceleration (related numerical)
	2nd	
	3rd	
	4th	
5th	1st	Centripetal and Centrifugal forces with live examples, Expression and applications such as banking of roads and bending of cyclist Numericals of Unit 2 <b>Unit 3: Work, Power and Energy</b> Work: Concept and units, examples of zero work, positive work and negative work Friction: concept, types, laws of limiting friction, coefficient of friction reducing friction and its engineering applications
	2nd	
	3rd	
	4th	
6th	1st	Work done in moving an object on horizontal and inclined plane for rough and plane surfaces and related applications Energy and its units, kinetic energy, gravitational potential energy with examples and derivations mechanical energy, conservation of mechanical energy for freely falling bodies, transformation of energy (examples) Power and its units, power and work relationship, calculation of power (numerical problems)
	2nd	
	3rd	
	4th	
	1st	

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7th	2nd	Numericals of Unit 3
	3rd	Revision of Unit 1 to 3
	4th	<b>Unit4: Rotational Motion</b> 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, radius of gyration for rigid body
	4th	Theorems of parallel and perpendicular axes (statements only)
9th	1st	Moment of inertia of rod, disc, ring and sphere (hollow and solid). (Formulae only)
	2nd	Numericals of Unit 4
	3rd	<b>Unit5: Properties of Matter</b> Elasticity: definition of stress and strain, moduli of elasticity
	4th	Hooke's law, significance of stress-strain curve.
10th	1st	Pressure: definition, units, atmospheric pressure, gauge pressure, absolute pressure
	2nd	Fortin's Barometer and its applications.
	3rd	Surface tension: concept, units, cohesive and adhesive forces
	4th	angle of contact, Ascent Formula (No derivation)
11th	1st	applications of surface tension, effect of temperature and impurity on surface tension.
	2nd	Viscosity and coefficient of viscosity: Terminal velocity
	3rd	Stoke's law and effect of temperature on viscosity
	4th	application in hydraulic systems
12th	1st	Hydrodynamics: Fluid motion, streamline and turbulent flow
	2nd	Reynold's number, Equation of continuity
	3rd	Bernoulli's Theorem (only formula and numerical) and its applications
	4th	Numericals of Unit 5
13th	1st	<b>Unit 6: Heat and Thermometry</b> Concept of heat and temperature, modes of heat transfer (conduction, convection and radiation with examples)
	2nd	specific heats, scales of temperature and their relationship
	3rd	Types of Thermometer (Mercury thermometer, bimetallic thermometer)
	4th	Types of Thermometer (Platinum resistance thermometer, Pyrometer)
14th	1st	Usage of Thermometers
	2nd	Expansion of solids, liquids and gases
	3rd	coefficient of linear, surface and cubical expansions
	4th	Relation between coefficient of linear and surface expansions
15th	1st	Relation between coefficient of linear and cubical expansions
	2nd	Co-efficient of thermal conductivity, engineering applications
	3rd	Numericals of Unit 6
	4th	Revision of Unit 4 to 6

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