


GOVERNMENT POLYTECHNIC NAVAGARH

LESSON PLAN-2025 (W); AY :2025-26

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

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7th	2nd	Numericals of Unit 3
	3rd	Revision of Unit 1 to 3
	4th	Unit 4: Rotational Motion
	1st	Translational and rotational motions with examples
8th	2nd	Definition of torque and angular momentum and their examples
	3rd	Conservation of angular momentum (quantitative) and its applications.
	4th	Moment of inertia and its physical significance, radius of gyration for rigid body
	1st	Theorems of parallel and perpendicular axes (statements only)
9th	2nd	Moment of inertia of rod, disc, ring and sphere (hollow and solid) (Formulae only)
	3rd	Numericals of Unit 4
	4th	Units: Properties of Matter
	1st	Elasticity: definition of stress and strain, moduli of elasticity
10th	2nd	Hooke's law, significance of stress-strain curve.
	3rd	Pressure: definition, units, atmospheric pressure, gauge pressure, absolute pressure
	4th	Fortin's Barometer and its applications.
	1st	Surface tension: concept, units, cohesive and adhesive forces
11th	2nd	angle of contact, Ascent Formula (No derivation)
	3rd	applications of surface tension, effect of temperature and impurity on surface tension.
	4th	Viscosity and coefficient of viscosity: Terminal velocity
	1st	Stoke's law and effect of temperature on viscosity
12th	2nd	application in hydraulic systems
	3rd	Hydrodynamics: Fluid motion, streamline and turbulent flow
	4th	Reynold's number, Equation of continuity
	1st	Bernoulli's Theorem (only formula and numerical) and its applications
13th	2nd	Numericals of Unit 5
	3rd	Unit 6: Heat and Thermometry
	4th	Concept of heat and temperature, modes of heat transfer (conduction, convection and radiation with examples)
	1st	specific heats, scales of temperature and their relationship
14th	2nd	Types of Thermometer (Mercury thermometer, bimetallic thermometer)
	3rd	Types of Thermometer (Platinum resistance thermometer, Pyrometer)
	4th	Usage of Thermometers
	1st	Expansion of solids, liquids and gases
15th	2nd	coefficient of linear, surface and cubical expansions
	3rd	Relation between coefficient of linear and surface expansions
	4th	Relation between coefficient of linear and cubical expansions
	1st	Co-efficient of thermal conductivity, engineering applications
	2nd	Numericals of Unit 6
	3rd	Revision of Unit 4 to 6
	4th	


 18.07.25
 Prof. 11 physics