ସରକାରୀ ବହୁବୃତ୍ତି ବୈଷୟିକ ଶିକ୍ଷାନୁଷ୍ଠାନ କନ୍ଧମାଲ, ଫୁଲବାଣୀ

GOVERNMENT POLYTECHNIC - KANDHAMAL, PHULBANI

Lesson Plan

Discipline: Civil, Electrical, Mechanical & Comp. SC		Semester: 1st	Name of Faculty : Sri Jiten Mishra	
Subject: Applied Physics - I	**No. of days per week Class allotted:** 4	Semester From Date: 06-08-2025 To date : 04-12-2025		
Week	**Class Day**	**Theory**		
1st	1st	Introduction to the Subject, Syllabus and Course Outcomes		
	2nd	**Unit 1: Physical world, Units and Measurements** 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		
2nd	1st	Checking of dimensional correctness of equations		
	2nd	Derivation of simple equations, Limitations of dimensional analysis.		
	3rd	Measurements: Need, measuring instruments, least count, types of measurement (direct, indirect)		
	4th	Errors in measurements (systematic and random), absolute error, relative error, Error propagation, error estimation		
3rd	1st	Significant figures		
	2nd	**Unit 2: Force and Motion** Scalar and Vector quantities – examples, representation of vector, types of vectors.		
	3rd	Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only)		
	4th	Scalar Product		
4th	1st	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,		
	4th	Applications of Conservation of Linear Momentum: such as recoil of gun, rockets, Impulse and its applications.		
5th	1st	Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period		
	2nd	Relation between linear and angular velocity, linear acceleration and angular acceleration (related numerical), Centripetal and Centrifugal forces with live examples		
	3rd	Expression and applications such as banking of roads and bending of cyclist.		

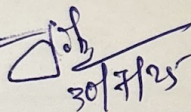| Week	Class Day	Theory
	4th	Doubt Clear Class
6th	1st	**Unit 3: Work, Power and Energy** Work: Concept and units, examples of zero work, positive work and negative work
	2nd	Friction: concept, types, Laws of limiting friction
	3rd	Coefficient of friction, Reducing friction and its engineering applications
	4th	Work done in moving an object on horizontal and inclined plane for rough and plane surfaces and related applications.
7th	1st	Energy and its units, kinetic energy, gravitational potential energy with examples Derivation of gravitational potential energy
	2nd	Mechanical energy, conservation of mechanical energy for freely falling bodies, trans- formation of energy (examples).
	3rd	Power and its units, power and work relationship, calculation of power (numerical problems).
	4th	Doubt Clear Class
8th	1st	**Unit 4: Rotational Motion** Translational and rotational motions with examples, Definition of torque and their examples
	2nd	Definition of angular momentum and their examples. Conservation of angular momentum (quantitative) and its applications.
	3rd	Moment of inertia and its physical significance
	4th	Radius of gyration for rigid body
9th	1st	Theorem of parallel axes (statements only)
	2nd	Theorem of perpendicular axes (statements only),
	3rd	Moment of inertia of rod, disc, ring and sphere (hollow and solid); (Formulae only).
	4th	Doubt Clear Class
10th	1st	**Unit 5: Properties of Matter** **Elasticity:** definition of stress and strain
	2nd	Moduli of elasticity, 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.
11th	1st	**Surface tension:** concept, units, cohesive and adhesive forces
	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:
12th	1st	Terminal velocity, Stoke's law
	2nd	Effect of temperature on viscosity, application in hydraulic systems.
	3rd	Hydrodynamics: Fluid motion, stream line and turbulent flow
	4th	Reynold's number Equation of continuity
13th	1st	Bernoulli's Theorem (only formula and numericals) and its applications.
	2nd	Doubt Clear Class
	3rd	**Unit 6: Heat and Thermometry** Concept of heat and temperature, modes of heat transfer (conduction, convection and radiation with examples),
	4th	Scales of temperature and their relationship

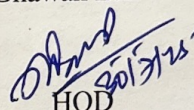| Week	Class Day	Theory
14th	1st	Specific heats
	2nd	Types of Thermometer (Mercury thermometer, Bimetallic thermometer and their uses.
	3rd	Platinum resistance thermometer, Pyrometer and their uses.
	4th	Expansion of solids, liquids and gases, coefficient of linear, surface and cubical expansions
15th	1st	Relation amongst coefficient of linear, surface and cubical expansions
	2nd	Co-efficient of thermal conductivity, engineering applications
	3rd	Revision
	4th	Revision

BOOK REFERNCE:

1. Applied Physics-I (English) by Prof. Vinod Kumar Yadav
2. Text Book of Physics for Class XI & XII(Part-I, Part-II); N.C.E.R.T., Delhi
3. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi

Concerned faculty:
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