



**GOVERNMENT POLYTECHNIC, KENDRAPARA,
DEPARTMENT OF HUMANITIES AND SCIENCE**

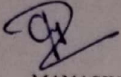
Discipline:	Semester: 1ST COMMON	Name of the Teaching Faculty: MANASWINEE PATNAIK (Lecturer) SUSHRI SANGEETA BEHERA (GF)	
Subject: APPLIED PHYSICS-I (Th-2)	No. of days/per week class allotted: 04	Semester From date: 06.08.2025 to Date: 04.12.2025 No. of Weeks: 15	
PRE-REQUISITES	Basic knowledge of Science and Mathematics.		
COURSE OUTCOMES	CO1	Classify different physical quantities and derive their units and dimensions.	
	CO2	Differentiate between scalar and vector quantity and use its properties to understand physical laws & different types of motion.	
	CO3	Apply the basic concept of force, torque, work, energy, power, friction, Moment of Inertia to solve simple classical Mechanics problems.	
	CO4	Apply different laws of elasticity, hydro statics and hydro dynamics to calculate various mechanical properties of solid and fluids.	
	CO5	Analyze various modes of heat transfer and behaviour of matter under exposure of heat and select appropriate thermometer to measure various range of temperature in industrial application.	
Week	Class Day	Theory/Practical Topics	DELIVERY METHOD
1ST	1ST	Introduction to syllabus	PPT
	2ND	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	CHALK & TALK
	3RD	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	CHALK & TALK
	4TH	Measurements: 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	CHALK & TALK
2ND	1ST	Numericals, Assignment	PPT
	2ND	Monthly Test - 1	CHALK & TALK
	3RD	Assignment checking & Monthly Test note distribution	CHALK & TALK
	4TH	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	CHALK & TALK
3RD	1ST	Force, Momentum, Statement and derivation of conservation of linear momentum, its applications such as recoil of gun, Impulse and its applications	CHALK & TALK

	2ND	Rockets, Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period	CHALK & TALK
	3RD	Relation between linear and angular velocity, linear acceleration and angular acceleration, Centripetal and Centrifugal forces with live examples	CHALK & TALK
	4TH	Expression and applications such as banking of roads and bending of cyclist	CHALK & TALK
4TH	1ST	Numericals	PPT
	2ND	Revision of Unit – 2 & 1, Discussion of Assignment	PPT
	3RD	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, Work done in moving an object on horizontal and inclined plane for rough and plane surfaces and related applications	CHALK & TALK
	4TH	Energy and its units, kinetic energy, gravitational potential energy with examples and derivations, mechanical energy, trans- formation of energy (examples)	CHALK & TALK
5TH	1ST	conservation of mechanical energy for freely falling bodies, Power and its units, power and work relationship, calculation of power	CHALK & TALK
	2ND	Numerical Problems	CHALK & TALK
	3RD	Monthly Test - 2	CHALK & TALK
	4TH	Assignment checking & Monthly Test note distribution	CHALK & TALK
6TH	1ST	Translational and rotational motions with examples, Definition of torque and angular momentum and their examples, Conservation of angular momentum (quantitative) and its applications	CHALK & TALK
	2ND	Moment of inertia and its physical significance, radius of gyration for rigid body, Theorems of parallel and perpendicular axes	CHALK & TALK
	3RD	Moment of inertia of rod, disc, ring and sphere (hollow and solid)	CHALK & TALK
	4TH	Numerical Problems	PPT, CHALK & TALK
7TH	1ST	Revision of Unit – 3 & 4	PPT
	2ND	Discussion of Assignment	CHALK & TALK
	3RD	Elasticity: definition of stress and strain, moduli of elasticity, Hooke's law, significance of stress-strain curve	CHALK & TALK
	4TH	Pressure: definition, units, atmospheric pressure, gauge pressure, absolute pressure, Fortin's Barometer and its applications	CHALK & TALK
8TH	1ST	Surface tension: concept, units, cohesive and adhesive forces, angle of contact, Ascent Formula, applications of surface tension, effect of temperature and impurity on surface tension	CHALK & TALK
	2ND	Viscosity and coefficient of viscosity: Terminal velocity, Stoke's law and effect of temperature on viscosity, application in hydraulic systems	CHALK & TALK
	3RD	Hydrodynamics: Fluid motion, stream line and turbulent	CHALK & TALK

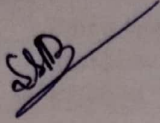
		flow, Reynold's number Equation of continuity	
	4TH	Bernoulli's Theorem and its applications	CHALK & TALK
9TH	1ST	Revision of Unit - 5	PPT
	2ND	Monthly Test - 3	CHALK & TALK
	3RD	Assignment checking & Monthly Test note distribution	CHALK & TALK
	4TH	Concept of heat and temperature, modes of heat transfer (conduction, convection and radiation with examples), specific heats, scales of temperature and their relationship	CHALK & TALK
10TH	1ST	Types of Thermometer (Mercury thermometer, Bimetallic thermometer, Platinum resistance thermometer, Pyrometer) and their uses	CHALK & TALK
	2ND	Expansion of solids, liquids and gases, coefficient of linear, surface and cubical expansions and relation amongst them	CHALK & TALK
	3RD	Co-efficient of thermal conductivity, engineering applications	CHALK & TALK
	4TH	Numerical Problems	CHALK & TALK
11TH	1ST	Revision of Unit - 6 & 5	CHALK & TALK
	2ND	Assignment checking & Discussion	CHALK & TALK
	3RD	Revision of Unit -1	PPT
	4TH	Revision of Unit -1	CHALK & TALK
12TH	1ST	Revision of Unit -2	PPT
	2ND	Revision of Unit -2	CHALK & TALK
	3RD	Revision of Unit -3	PPT
	4TH	Revision of Unit -3	CHALK & TALK
13TH	1ST	Revision of Unit -4	PPT
	2ND	Revision of Unit -4	CHALK & TALK
	3RD	Revision of Unit -5	PPT
	4TH	Revision of Unit -5	CHALK & TALK
14TH	1ST	Revision of Unit -6	PPT
	2ND	Revision of Unit -6	CHALK & TALK
	3RD	Previous Year Question Paper Discussion	PPT
	4TH	Previous Year Question Paper Discussion	CHALK & TALK
15TH	1ST	Previous Year Question Paper Discussion	CHALK & TALK
	2ND	Practice Test (Semester Pattern)	
	3RD	Practice Test (Semester Pattern)	
	4TH	Practice Test (Semester Pattern)	

LEARNING RESOURCES:

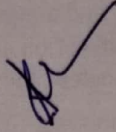
1. Applied Physics-I (English) by Prof. Vinod Kumar Yadav (down load from <https://ekumbh.aicte-india.org/dbook.php>)
2. Text Book of Physics for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi
3. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi



MANASWINEE
PATNAIK



SUSHREE SANGITA
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Signature of Faculty concerned

G. P. KENDRADA

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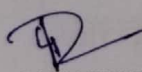
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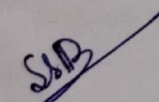
Discipline:	Semester: 1ST COMMON	Name of the Teaching Faculty: MANASWINEE PATNAIK (Lecturer) SUSHRI SANGEETA BEHERA (GF)	
Subject: APPLIED PHYSICS-I LAB (Pr-2)	No. of days/per week class allotted: 02	Semester From date: 06.08.2025 to Date: 04.12.2025 No. of Weeks: 15	
PRE-REQUISITES	Basic knowledge of Science and Mathematics.		
COURSE OUTCOMES	CO1	Understand the measurement techniques.	
	CO2	Verify the basic laws of forces & principles in physics.	
	CO3	Analyze the motion & mechanics.	
	CO4	Understand the temperature measurement & conversions.	
	CO5	Operate & control the required equipment with proper precaution either in group or individually.	
Week	Class Day	Practical Topics	DELIVERY METHOD
1ST	1ST	Introduction to syllabus	PPT
	2ND	To measure length, radius of a given cylinder, a test tube and a beaker using a Vernier caliper and find volume of each object.	DEMONSTRATION
2ND	1ST	To measure length, radius of a given cylinder, using a Vernier caliper and find volume of the given cylinder.	DEMONSTRATION
	2ND	To measure length, radius of a test tube and a beaker using a Vernier caliper and find volume of each object.	DEMONSTRATION
3RD	1ST	To measure length, radius of a given cylinder, a test tube and a beaker using a Vernier caliper and find volume of each object.	Record & Viva
	2ND	To determine diameter of a wire using a screw gauge.	DEMONSTRATION
4TH	1ST	To determine diameter a solid ball and thickness of cardboard using a screw gauge.	DEMONSTRATION
	2ND	To determine diameter of a wire, a solid ball and thickness of cardboard using a screw gauge.	Record & Viva
5TH	1ST	To determine radius of curvature of a convex and a concave mirror/surface using a spherometer.	DEMONSTRATION
	2ND	To determine radius of curvature of a convex and a concave mirror/surface using a spherometer.	DEMONSTRATION
6TH	1ST	To determine radius of curvature of a convex and a concave mirror/surface using a spherometer.	Record & Viva
	2ND	To verify triangle and parallelogram law of forces.	DEMONSTRATION
7TH	1ST	To verify triangle and parallelogram law of forces.	DEMONSTRATION
	2ND	To verify triangle and parallelogram law of forces.	Record & Viva
	1ST	To find the co-efficient of friction between wood and glass using a horizontal board.	DEMONSTRATION
	2ND	To find the co-efficient of friction between wood and glass	DEMONSTRATION


8TH		using a horizontal board.	Record & Viva
9TH	1ST	To find the co-efficient of friction between wood and glass using a horizontal board.	DEMONSTRATION
	2ND	To determine force constant of a spring using Hook's Law.	DEMONSTRATION
10TH	1ST	To determine force constant of a spring using Hook's Law.	Record & Viva
	2ND	To determine force constant of a spring using Hook's Law.	DEMONSTRATION
11TH	1ST	To verify law of conservation of mechanical energy (PE to KE).	Record & Viva
	2ND	To verify law of conservation of mechanical energy (PE to KE).	DEMONSTRATION
12TH	1ST	To find the viscosity of a given liquid (Glycerin) by Stoke's law.	DEMONSTRATION
	2ND	To find the viscosity of a given liquid (Glycerin) by Stoke's law.	Record & Viva
13TH	1ST	To find the viscosity of a given liquid (Glycerin) by Stoke's law.	DEMONSTRATION
	2ND	To measure room temperature and temperature of a hot bath using mercury thermometer and convert it into different scales.	Record & Viva
14TH	1ST	To measure room temperature and temperature of a hot bath using mercury thermometer and convert it into different scales.	DEMONSTRATION
	2ND	Repeat Experiment/ Record Checking/ Viva/ Sessional Evaluation	Record & Viva
15TH	1ST	Repeat Experiment/ Record Checking/ Viva/ Sessional Evaluation	Record & Viva
	2ND	Repeat Experiment/ Record Checking/ Viva/ Sessional Evaluation	Record & Viva

LEARNING RESOURCES:

1. Applied Physics-I (English) by Prof. Vinod Kumar Yadav (Download from <https://ekumbh.aicte-india.org/dbook.php>)
2. Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publications (P)Ltd.,
3. Practical Physics by C. L. Arora, S. Chand Publication.
4. e-books/e-tools/ learning physics software/YouTube videos/websites etc.


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