

RAMGARHIA POLYTECHNIC COLLEGE, PHAGWARA					
DEPARTMENT OF MECHANICAL ENGINEERING					
LESSON PLAN					
HEAD OF DEPARTMENT			Sh. GAURAV KUMAR		
NAME OF FACULTY			S. JASWINDER SINGH		
DISCIPLINE			APPLIED SCIENCE		
SEMESTER			1ST		
SUBJECT			APPLIED PHYSICS-1		
Lesson Plan duration 16 weeks (August 2022 to November 2022)					
		Theory		Practical	
	Lecture/D ay	Topic including Assignment, Test and Parent Teacher meetings.	DAY	TOPIC (to perform minimum eight experiments)	
week1	1	1. Units and Dimensions, Introduction to physics and the unit, why physics is called mother of all sciences, importance of measurement.	1	1st experiment demonstration. To find volume of solid sphere using a vernier calipers	
week1	2	1.1 Physical quantities, Units.	2	Practical performance by students	
week1	3	Fundamental and derived units, systems of units (FPS, CGS, MKS and SI units)			
week1	4	1.2 Dimensions and dimensional formulae of physical quantities (area, volume, velocity, acceleration, momentum, force, impulse, work, power, energy, surface tension, coefficient of viscosity, stress, strain, moment of inertia, gravitational constant.)			
WEEK2	5	1.3 Principle of homogeneity of dimensions 1.4 Dimensional equations and their applications,	3	Demonstration and discussion about Experiment no. 2. To find internal diameter and depth of a beaker using a vernier calipers and hence find its volume.	
WEEK2	6	conversion from one system of units to other,	4	Students will perform experiment no. 2	
WEEK2	7	checking of dimensional equations			
WEEK2	8	and derivation of simple equations			
week3	9	1.5 Limitations of dimensional analysis 1.6 Error in measurement, absolute error, relative error, rules for representing significant figures in calculation.	5	repetition of Experiment no. 1&2, performance and completion by students	
week3	10	1.7 Application of units and dimensions in measuring length, diameter, circumference, volume, surface area etc. of metallic and non metallic blocks, wires, pipes etc (at least two each).	6	repetition of Experiment no. 1&2, performance and completion by students	
WEEK3	11	2. Force and Motion, 2.1 Scalar and vector quantities – examples, representation of vector, types of vectors			
WEEK3	12	2.2 Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only),			
WEEK4	13	Examples and Numerical problems Parallelogram Law of Vectors.	7	demonstration and discussion about Experiment no.3. To find the diameter of wire using a screw gauge	
WEEK4	14	Scalar and Vector Product,	8	students will perform experiment no. 3	
week4	15	2.3 Resolution of Vectors and its application to lawn roller.			
week4	16	2.4 Force,			
WEEK5	17	Momentum, Statement and Derivation of Conservation of linear momentum, its applications such as recoil of gun.	9	Demonstration and discussion about Experiment no. 4. To determine the thickness of glass strip using a spherometer	
WEEK5	18	2.5 Impulse and its Applications	10	students will perform experiment no.4	
WEEK5	19	2.6 Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period. 2.7 Relation between linear and angular velocity, linear acceleration and angular acceleration (related numerical)			
WEEK5	20	2.8 Expression and Applications of Centripetal and centrifugal forces with examples such as banking of roads and bending of cyclist			

week6	21	2.9 Application of various forces in lifts, cranes, large steam engines and turbines	11	Demonstration and discussion about Experiment no.5. To verify parallelogram law of forces	
week6	22	Parents And Teachers meeting, And Test-1	12	Demonstration and discussion about Experiment no.6. To study conservation of energy of a ball or cylinder rolling down an inclined plane.	
WEEK6	23	3.Work, Power and Energy (10 hrs) 3.1 Work: and its units, examples of zero work, positive work and negative work			
WEEK6	24	3.2 Friction: modern concept, types, laws of limiting friction, Coefficient of friction and its Engineering Applications.			
WEEK7	25	3.3 Work done in moving an object on horizontal and inclined plane for rough and plane surfaces with its applications	13	students will perform experiment no.5 and 6 in groups	
WEEK7	26	3.4 Energy and its units: Kinetic energy and gravitational potential energy with examples and their derivation	14	students will perform experiment no.5 and 6 in groups	
week7	27	3.5 Principle of conservation of mechanical energy for freely falling bodies, examples of transformation of energy.			
week7	28	3.6 Power and its units, calculation of power in numerical problems			
WEEK8	29	3.7 Application of Friction in brake system of moving vehicles, bicycle, scooter, car trains etc.	15	students will perform experiment no.5 and 6 in groups	
WEEK8	30	discussion on difficulties and numericals	16	students will perform experiment no.5 and 6 in groups	
WEEK8	31	4 Rotational Motion , 4.1 Concept of translatory and rotatory motions with examples			
WEEK8	32	4.2 Definition of torque and angular momentum and their examples			
week9	33	4.3 Conservation of angular momentum (quantitative) and its examples	17	Demonstration and discussion about Experiment no. 7. To find the Moment of Inertia of a flywheel about its axis of rotation	
week9	34	Applications and Discussion	18	Demonstration and discussion about Experiment no.8. To determine the atmospheric pressure at a place using Fortin's Barometer	
WEEK9	35	4.4 Moment of inertia and its physical significance, radius of gyration for rigid body,			
WEEK9	36	numerical problems and discussion of topic			
WEEK10	37	Theorems of parallel and perpendicular axes (statements only)	19	students will perform experiment no.7 and 8 in groups	
WEEK10	38	Moment of inertia of rod, disc, ring and sphere (hollow and solid) (Formulae only).	20	students will perform experiment no.7 and 8 in groups	
week10	39	4.5 Application of rotational motions in transport vehicles, and machines.			
week10	40	Parents And Teachers meeting, And Test-2			
WEEK11	41	5. Properties of Matter (12 hrs) 5.1 Elasticity: definition of stress and strain,	21	students will perform experiment no.7 and 8 in groups	
WEEK11	42	different types of moduli of elasticity, Hooke's law,	22	students will perform experiment no.7 and 8 in groups	
WEEK11	43	significance of stress strain curve			
WEEK11	44	5.2 Pressure: definition, its units, atmospheric pressure, gauge pressure, absolute pressure, Fortin's Barometer and its applications			
week12	45	5.3 Surface tension: concept, its units, angle of contact, Ascent Formula (No derivation),	23	students who are unable to perform any experiment will be given chance to perform from experiment no.1-8	
week12	46	applications of surface tension, effect of temperature and impurity on surface tension	24	students who are unable to perform any experiment will be given chance to perform from experiment no.1-8	
WEEK12	47	5.4 Viscosity and coefficient of viscosity: Terminal velocity, Stoke's law and effect of temperature on viscosity, application in hydraulic systems.			
WEEK12	48	5.5 Concept of fluid motion, stream line and turbulent flow, Reynold's number Equation of continuity,			

WEEK13	49	Bernoulli's Theorem and their applications (no derivation and numerical).	25	Practicals checking, and viva voice test	
WEEK13	50	Applications of Bernoulli's Theorm.	26	Practicals checking, and viva voice test	
week13	51	discussion on difficulties and Problems			
week13	52	6. Thermometry (10 hrs) 6.1 Difference between heat and temperature			
WEEK14	53	6.2 Modes of transfer of heat (Conduction, convection and radiation with examples)	27	demonstration and discussion about Experiment no. 9. To determine the viscosity of glycerin by Stoke's method	
WEEK14	54		28	demonstration and discussion about Experiment no.11. To determine force constant of spring using Hooks law	
WEEK14	55	6.3 Different scales of temperature and their relationship			
WEEK14	56	6.4 Types of Thermometer (Mercury Thermometer, Bimetallic Thermometer, Platinum resistance Thermometer, Pyrometer)			
week15	57	6.5 Expansion of solids, liquids and gases, coefficient of linear, surface and cubical expansions and relation amongst them	29	students will perform experiment no.9 and 10 in groups	
week15	58	6.6 Concept of Co-efficient of thermal conductivity	30	students will perform experiment no.9 and 10 in groups	
WEEK15	59	6.7 Application of various systems of thermometry in refrigeration and air[1]conditioning etc.			
WEEK15	60	Discussion about dificulties			
WEEK16	61	Parents teacher meet	31	Discussion about experiments and viva voice	
WEEK16	62	House Test-3	32	Discussion about experiments and viva voice	
week16	63	Discussion about House test and other problems.			
week16	64	discussion in class about subject.			