GANDHI ACADEMY OF TECHNOLOGY AND ENGINEERING

(Approved by AICTE, New Delhi, Affiliated to BPUT, Odisha and Recognized by Dept. of SD&TE, Govt. of Odisha)
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APPLIED PHYSICS-1 LESSON PLAN (DEPT. OF BASIC SCIENCE AND HUMANITIES)

SL No.	Date of Class	Unit No.	Topic to be Covered	Relating to COs	Method of instruction	Remarks
1		1	Introduction to Physical quantities - Definition of fundamental and derived units systems of units Definition of dimension	CO1	Chalk & Talk	
2		1	Dimensional formulae of physical quantities.Dimensional equations and Principle of homogeneity.	CO1	Chalk & Talk	
3		1	Dimensional equations and their applications (conversion from one system of units to other,	CO1	Chalk & Talk	
4		1	checking of dimensional equations	CO1	Chalk & Talk	
5		1	derivation of simple equations	CO1	Chalk & Talk	
6		1	Limitations of dimensional analysis.	CO1	Chalk & Talk	
7		1	**Measurements**: Need, measuring instruments,	CO1	Chalk & Talk	
8		1	least count, types of measurement (direct, indirect),	CO1	Chalk & Talk	
9		1	Errors in measurements (systematic and random), absolute error, relative error, error propagation,	CO1	Chalk & Talk	
10		1	Error estimation and significant figures. **Course Beyond Syllabus:** Classification of Physical quantities, Simple Numerical problems	CO1	Chalk & Talk	
11		2	Introduction to Scalar and Vector quantities Representation of a Vector – examples, types of vectors.	CO2	Chalk & Talk	
12		2	Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only), Simple Numerical	CO2	Chalk & Talk	
13		2	Scalar and Vector Product, Simple Numerical	CO2	Chalk & Talk	
14		2	Resolution of a Vector and its application to inclined plane and lawn roller.	CO2	Chalk & Talk	
15		2	Force, Momentum, Newton's law of motion	CO2	Chalk & Talk	
16		2	Statement and derivation of conservation of linear momentum,	CO2	Chalk & Talk	
17		2	applications such as recoil of gun,	CO2	Chalk & Talk	

			rockets,			
18		2	Impulse and its applications.	CO2	Chalk & Talk	
19		2	**Circular motion**, definition of angular displacement, angular velocity, angular acceleration, frequency, time period,	CO2	Chalk & Talk	
20		2	Relation between linear and angular velocity, linear acceleration and angular acceleration related numerical), Centripetal and Centrifugal forces with live examples,	CO2	Chalk &Talk	
21		2	Expression and applications such as banking of roads and bending of cyclist, **Course Beyond Syllabus:** Numerical problems related to bending angle of a cyclist , Numerical problems related to vectors.	CO2	Chalk & Talk	
22		3	**Work:** Concept and units, examples of zero work, positive work and negative work.	CO3	Chalk & Talk	
23		3	**Friction:** Definition & Concept. Types of friction (static, dynamic)	CO3	Chalk & Talk	
24		3	Limiting Friction (Definition with Concept),laws of limiting friction, coefficient of friction, Simple Numericals.	CO3	Chalk & Talk	
25		3	reducing friction and its engineering applications,	CO3	Chalk & Talk	
26		3	Work done in moving an object on horizontal and inclined plane for rough and plane surfaces and related applications.	CO3	Chalk & Talk	
27		3	**Energy** and its units, kinetic energy, gravitational potential energy with examples derivations,	CO3	Chalk & Talk	
28		3	Mechanical energy, conservation of mechanical energy for freely falling bodies, trans- formation of energy (examples).	CO-3	Chalk & Talk	
29		3	**Power** and its units, power and work relationship, calculation of power (numerical problems).	CO-3	Chalk & Talk	
30		3	**Course Beyond Syllabus:** Types of Simple Numericals related to work,	CO3	Chalk & Talk	
31		4	Translational and rotational motions with examples	CO3	Chalk & Talk	
32		4	Definition of torque and angular momentum and their examples,	CO3	Chalk & Talk	
33		4	Conservation of angular momentum	CO3	Chalk & Talk	

			(quantitative) and its applications.			
34		4	Moment of inertia and its physical significance, Relation between torque & moment of inertia, Relation between angular momentum & moment of inertia,	CO3	Chalk & Talk	
35		4	radius of gyration for rigid body, Theorems of parallel and perpendicular axes (statements only)	CO3	Chalk & Talk	
36		4	Moment of inertia of rod, disc, ring and sphere (hollow and solid); (Formulae only). **Course Beyond Syllabus:** Theorems of parallel and perpendicular axes (derivation),	CO3	Chalk & Talk	
37		5	**Elasticity**: definition of stress and strain, moduli of elasticity,	CO4	Chalk & Talk	
38		5	Hooke's law, significance of stress-strain curve.	CO4	Chalk & Talk	
39		5	significance of stress-strain curve.	CO4	Chalk & Talk	
40		5	**Pressure**: definition, units, atmospheric pressure, gauge pressure, absolute pressure,	CO4	PPT	
41		5	Fortin's Barometer and its applications.	CO4	PPT	
42		5	**Surface tension**: concept, units, cohesive and adhesive forces, angle of contact,	CO4	Chalk & Talk	
43		5	Ascent Formula (No derivation), applications of surface tension, effect of temperature and impurity on surface tension.	CO4	Chalk & Talk	
44		5	Viscosity and coefficient of viscosity:	CO4	Chalk & Talk	
45		5	Terminal velocity, Stoke's law	CO4	Chalk & Talk	
46		5	effect of temperature on viscosity, application in hydraulic systems.	CO4	Chalk & Talk	
47		5	**Hydrodynamics**: Fluid motion, stream line and turbulent flow,	CO4	Chalk & Talk	
48		5	Reynold's number Equation of continuity,	CO4	Chalk & Talk	
49		5	Bernoulli's Theorem (only formula and numericals) and its applications.	CO4	Chalk & Talk	
50		5	**Course Beyond Syllabus:** Types of stress & Types of strain, Angle of repose	CO4	Chalk & Talk	
51		6	Heat and Temperature – Definition & DifferenceUnits of Heat (FPS, CGS, MKS	CO5	Chalk & Talk	

			& SI).			
52		6	Concept of heat and temperature, and its difference	CO5	Chalk & Talk	
53		6	modes of heat transfer (conduction, convection and radiation with examples),	CO5	Chalk & Talk	
54		6	Specific Heat, scales of temperature and their relationship,	CO5	Chalk & Talk	
55		6	Types of Thermometer (Mercury thermometer, Bimetallic thermometer, Platinum resistance thermometer, Pyrometer) and their uses.	CO5	Chalk & Talk	
56		6	Thermal Expansion – Definition & Concept Expansion of Solids, liquids, gases, (Concept)	CO5	Chalk & Talk	
57		6	Coefficient of linear, superficial and cubical expansions of Solids – Definition & Units ,	CO5	Chalk & Talk	
58		6	Relation between **α**, **β** &**ϒ .** Co-efficient of thermal Conductivity, engineering applications.	CO5	Chalk & Talk	
59		6	**Course Beyond Syllabus:** Change of state (concept), Latent Heat (concept, definition, unit, dimension and simple numerical)	CO5	Chalk & Talk	
60		6	First Law of Thermodynamics (Statement and concept only) Work and Heat - Concept & Relation, Joule's Mechanical Equivalent of Heat (Definition, Unit)	CO5	Chalk & Talk	

References:

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. Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi.
4. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
5. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi
6. Engineering Physics by DK Bhhatacharya &Poonam Tandan; Oxford University Press, New Delhi.
7. Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publications (P) Ltd., New Delhi
8. Practical Physics by C. L. Arora, S. Chand Publication.
9. e-books/e-tools/ learning physics software/websites etc

Signature of the HOD **Signature of Faculty**