VTI, ROHTAK — Lesson Plan for First Year

Name of Faculty : SATISH JAIN / PARUL — Subject : Applied Physics

Discipline : Common for all branches — Lesson Plan Duration : 35 weeks

Work Load (Lecture/Tutorial/Practical) per week : Lecture - 02, Tutorial - 01 per group, Pract - 02 per group

Week	Theory		Tutorial		Practical	
	Lecture Day	Topic	Tut Day	Topic	Pract Day	Topic
1	1	Introduction about subject, syllabus, study schemes etc.	1	Introduction and importance of Tutorial, lesson plan etc	1	Introduction and familiarization with Lab apparatus
	2	Definition of Physics, Physical quantities (Fundamental and Derived)				
2	3	Units : Fundamental and Derived units Systems of units : CGS, FPS, MKS, SI	2	Problem discussion and solving	2	To find the diameter of a solid cylinder using a Vernier calliper
	4	Definitions of Dimensions, dimensional formula and dimensional equation with examples				
3	5	Dimensional formulae and SI units of Physical quantities as given in art. 1.5 of syllabus, Principle of Homogeneity of dimensions	3	Problem solving on dimensional formulae and SI units of physical quantities	3	To find the internal diameter and depth of a beaker using a Vernier calliper and hence find its volume
	6	Applications of dimensional analysis (equations) : checking of correctness of physical equations.				
4	7	Conversion of systems of units (force, work) using dimensional analysis	4	Numerical problems on checking of correctness of equations and conversion of systems of units	4	checking of files and Viva Voce
	8	Force and Motion :- Scalar and vector quantities - (Definition and examples), Types and addition of vectors				
5	9.	Triangle and Parallelogram laws of Vector addition (Statement only), Scalar and Vector Product of vectors (Statement and formula only)	5	Problem discussion and solving of Unit I (Units and Dimensions)	5	To find the diameter of wire using Screw gauge
	10	Definition of Distance, displacement, speed, velocity, acceleration and other basic quantities with and their units				
6	11	Force and its units, Concept of resolution of force	6	Idea of basic terms like rest, motion, momentum, equation of linear motion etc.	6	To find the thickness of paper using Screw gauge
	12	Newton's Laws of motion (Statement and examples)				

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Week	Theory: Lect. Day	Theory: Topic	Tutorial: Tut. Day	Tutorial: Topic	Practical: Pract. Day	Practical: Topic
7	13	Linear Momentum, Conservation of momentum (Statement only), Impulse	7	Problem discussion, solving and assignments	7	Checking of files and Viva Voce
	14	Circular motion: Definition of angular displacement, angular velocity, angular acceleration, frequency, time period				
8	15	Relation between linear and angular velocity, Relation between linear and angular acceleration	8	Discussion and solving the problems of Unit 2 (Force and motion)	8	To determine the thickness of a glass strip using a Spherometer
	16	Centripetal and centrifugal forces (Definition and formula only), Application of centripetal force in Banking of roads (Derivation for angle of banking)				
9	17	Work, Power and Energy: Work (Definition, Symbol, formula and SI unit), Energy (Definition and its SI unit)	9	Preparation for first internal assessment (problem solving)	9	To determine the radius of curvature of a given spherical surface by a Spherometer
	18	Kinetic Energy (Formula, examples and its derivation) Potential Energy (Formula, examples and its derivation)				
10	19	Examples of transformation of energy, Law of Conservation of mechanical energy for freely falling bodies (with derivation)	10	Problem discussion and solving	10	Checking of files and Viva Voce
	20	Power (definition, formula and units), Simple numerical problems based on formula of Power				
11	21	Rotational Motion: Rotational motion with examples, Moment of Inertia and its physical significance	11	Discussion and solving the problems of Unit 3 (Work, power and energy)	11	Revision of Practicals
	22	Radius of gyration (Definition, derivation and formula)				
12	23	Definition of torque and angular momentum and their examples Conservation of angular momentum (quantitative) and its examples	12	Problem discussion and solving	12	To Verify Parallelogram law of forces
	24	Properties of matter: Definition of Elasticity, Deforming force, Restoring force, examples of Elastic and Plastic body				
13	25	Definition of Stress and Strain with their types	13	Discussion and solving the problems of unit 4 (Rotational motion)	13	To determine force constant of spring using Hooke's Law
	26	Hooke's law, Modulus of Elasticity (Young's, Bulk modulus and shear)				

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Week	Theory		Tutorial		Practical	
	Lect. Day	Topic	Tut. Day	Topic	Pract. Day	Topic
14	27	Pressure (Definition, formula, unit), Pascals Law	14	Problem discussion and solving	14	Checking of files and Viva-voce
	28	Surface Tension : Definition, its units, Applications of surface tension, effect of temperature on surface tension				
15	29	Viscosity : definition, units, effect of temp. on viscosity Fluid motion, Stream line and turbulent flow	15	Problem discussion, solving and assignments	15	To determine the atmospheric pressure at a place using Fortin's Barometer
	30	Heat and temperature : Definition of heat and temperature (on the basis of Kinetic theory), Difference between heat and temperature				
16	31	Principles of measurement of temperature	16	Discussion and solving the problems of unit 5 (Properties of matter)	16	Revision of Practic
	32	Modes of transfer of heat (conduction, convection and radiation with examples), Properties of heat radiation				
17	33	Different scales of temperature measurement and their relationship	17	Preparation for IInd internal assessment (problem solving)	17	measuring room temperature with t help of thermometer and its conversion in different scale
	34	Wave motion and its applications : Wave motion, transverse and longitudinal wave motion with examples				
18	35	Terms used in wave motion like displacement amplitude, time period, frequency, wave length, wave velocity	18	Preparation for IInd internal assessment (problem solving)	18	Checking of fil and Viva-voce
	36	Relationship among wave velocity, frequency and wave length, Simple Harmonic Motion (SHM): definition, examples				
19	37	Cantilever (definition, formula of time period (without derivation))	19	Numerical problems on different scales of temperature measurement (problem solving)	19	To find the time period of a simpl pendulum
	38	Free, forced and resonant vibrations with examples Acoustics of buildings – Musical sound, noise, echo, Coefficient of absorption of sound				
20	39	Reverberation reverberation time, method to control reverberation time	20	Discussion and solving the problems of unit 6 (Heat and temperature)	20	To determine and verify the time period of a cantile
	40	Ultrasonics : Introduction and their engineering applications (cold welding, drilling and SONAR)				

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	Theory		Tutorial		Practical	
	Lect. Day	Topic	Tut. Day	Topic	Pract. Day	Topic
21	41 42	Optics: Reflection and Refration with laws, refractive index Total internal reflection and its applications, critical angle and condition for total internal reflection	21	Monthly Class test	21	Checking of files and Viva voce
22	43 44	Image formation by lens, lens formula (no derivation), Power of lens (related numerical problems) Microscope and Telescope (definition), Uses of microscope and telescope	22	Discussion and solving the problems of unit 7 (Wave motion and its applications)	22	To verify laws of reflection of light using mirror
23	45 46	Electrostatics: Electric Charge, unit of Charge, conservation of Charge, Coulomb's law of electrostatics Electric field, Electric lines of force (definition and properties)	23	Discussion and solving the problems of unit 8 (optics)	23	To find the focal length of a concave lens using a convex lens
24	47 48	Electric field intensity due to a point Charge, Definition and unit of electric flux and electric potential Gauss Law (Statement and derivation)	24	Problem discussion, solving and assignments	24	Checking of files and Viva-voce
25	49 50	Capacitor, capacitance (Definition, formula and units) Series and parallel combination of capacitors (derivation of equivalent capacitance)	25	Monthly Class test	25	To verify laws of refraction using glass slab
26	51 52	Electric current and its unit, Direct and alternating current, ohm's law (Statement and formula) Resistance, Specific Resistance and conductance (definition and units)	26	Simple numerical problems on series and parallel combination of capacitors	26	Revision of Practicals, Checking of files and Viva-voce
27	53 54	Heating effect of current, Electric power and its units Series and Parallel ~~Comb~~ combination of Resistances	27	Discussion and solving the problems of Unit 9 (Electrostatics)	27	To verify ohm's law by plotting a graph between voltage and current
28	55 56	Kirchhoff's laws (Statement and formula) Electromagnetism: Introduction to magnetism, Types of magnetic materials: Dia, para and ferromagnetic materials with examples	28	Simple numerical problems on series and parallel combination of resistances	28	To verify law of resistances in series combination

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Week	Theory Lect. Day	Theory Topic	Tutorial Tut Day	Tutorial Topic	Practical Pract Day	Practical Topic
29	57	magnetic field, magnetic intensity, magnetic lines of force, magnetic flux and their units	29	Discussion and solving the problems of unit 10 (current electricity)	29	To verify laws o resistances in parallel combinatio
	58	Electromagnetic induction (definition), Problems on electromagnetism				
30	59	Semiconductor Physics: Definition of energy level and energy bands, types of materials (insulators, conductors, semiconductors) with examples	30	monthly class test	30	Checking of file and Viva-voce
	60	Intrinsic and extrinsic semiconductors				
31	61	PN junction diode and its V-I Characteristics	31	Discussion and solving the problems of unit 11 (Electro-magnetism)	31	To study Colour Coding Scheme o resistence
	62	Diode as rectifier – half wave and full wave rectifier (centre tap only), Semiconductor transistor, PNP and NPN transistor (Introduction only), Symbol				
32	63	Modern Physics: LASER: full form, characteristics, principle, spontaneous and stimulated emission	32	Discussion and solving the problems of unit 12 (Semiconductor Physics)	32	To find the resistance of a galvanometer by half deflection meth
	64	Population inversion, engineering and medical applications of lasers				
33	65	Fibre optics: introduction to optical fibers (definition, parts), applications of optical fibers in different fields	33	Discussion and solving the problems of unit 13 (Modern Physics)	33	checking of file and Viva-Voce
	66	Introduction to nanotechnology (Definition of nano-materials with examples) and its applications				
34	67	Revision of units 6, 7 and 8	34	monthly class test	34	Revision of Practicals
	68	Revision of units 9 and 10				
35	69	Revision of units 11, 12 and 13	35	Preparation for final assessment (problem solving)	35	Revision of Practicals
	70	Problem Solving				