

LESSON PLAN

Discipline: Civil/Mech/Elect. /CSE	1st Year	Name Of The Teaching Faculty: Miss Suchana Sarangi Sr. Lecturer Physics
Subject: Applied Physics	No. Of Days/Week Class Allotted: 4	No. Of Weeks: 32 From – 17.08.2026 to 17.04.2027
Week	Class Day	Theory Topics
1	1	Unit 1: Physical world, Units and Measurements 1.1 Physical quantities: fundamental and derived
	2	Units and systems of units (FPS, CGS and SI units), Dimensions and dimensional formulae of different physical quantities
	3	Dimensional formula of velocity, acceleration, force, linear momentum, kinetic energy, potential energy, work, power, pressure and density
	4	Principle of homogeneity of dimensions, Dimensional equations and their applications, conversion from one system of units to other
2	1	Checking of dimensional equations
	2	Derivation of simple equations
	3	Limitations of dimensional analysis. 1.3 Errors in measurements (systematic and random)
	4	Absolute error, relative error, error propagation
3	1	Error estimation and significant figures
	2	Numerical problems with solutions
	3	Unit 2: Force and Friction 2.1 Scalar and Vector quantities – examples, representation of vector
	4	Types of vectors: Null vector, Unit vector, position vector, Equal vector, Negative vector, Collinear vector, Coplanar vector, Co-initial vector
4	1	Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only)
	2	Scalar and Vector Product, Properties of Dot Product & Cross product
	3	Resolution of a Vector, 2.2 Newton's Laws of Motion
	4	Force, Momentum, Statement and derivation of conservation of linear momentum
5	1	Applications of Conservation of Linear Momentum such as recoil of gun, rockets
	2	Impulse and its applications, 2.3 Friction: concept, types of Friction
	3	Laws of limiting friction, coefficient of friction, Angle of Friction
	4	Angle of Repose, Methods of reducing friction and its engineering applications.
6	1	Unit 3: Work, Power, Energy 3.1 Work: Concept and units, examples of zero work, positive work and negative work
	2	Energy and its units, kinetic energy, Work-Energy Theorem (Concepts only)
	3	Gravitational potential energy with examples and derivations
	4	Mechanical energy, conservation of mechanical energy for freely falling bodies.
7	1	3.2 Power and its units, power and work relationship
	2	Calculation of power (numerical problems).
	3	Unit 4: Circular & Rotational Motion 4.1 Circular motion: definition of angular displacement, angular velocity, angular acceleration, frequency, time period
	4	Relation between linear and angular velocity, linear acceleration and angular acceleration (related numerical)
8	1	Centripetal and Centrifugal forces with live examples
	2	Expression and applications such as banking of roads (without Friction) and bending of cyclist
	3	4.2 Translational and rotational motions with examples
	4	Definition of torque and angular momentum and their examples
9	1	Conservation of angular momentum (quantitative) and its applications.
	2	4.3 Moment of inertia and its physical significance
	3	Radius of gyration for rigid body
	4	Theorems of parallel and perpendicular axes (statements only)
10	1	Moment of inertia of rod, disc
	2	M.I. of ring and sphere (hollow and solid)
	3	Unit 5: Properties of Matter 5.1 Elasticity: definition of stress and strain
	4	Moduli of elasticity, Hooke's law, Significance of stress-strain curve
11	1	5.2 Pressure: definition, units, atmospheric pressure
	2	Gauge pressure, absolute pressure
	3	5.3 Surface tension: concept, units, cohesive and adhesive forces
	4	angle of contact, applications of surface tension
12	1	5.4 Viscosity and coefficient of viscosity: Terminal velocity
	2	Stoke's law and effect of temperature on viscosity
	3	Application in hydraulic systems
	4	5.5 Hydrodynamics: Fluid motion, streamline and turbulent flow
	1	Reynold's number, Equation of continuity
	2	Bernoulli's Theorem (only formula and numerical) and its applications.

13	3	Unit-6: Waves and Oscillations 6.1 Periodic Motion, Oscillatory Motion
	4	Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration
14	1	Time period, frequency, Total Energy of a particle executing SHM
	2	Free, forced and resonant vibrations with examples
	3	6.2 Wave motion, transverse and longitudinal waves with examples
	4	Definitions of wave velocity, frequency and wave length and their relationship
15	1	Wave equation, amplitude, phase
	2	Phase difference
	3	principle of superposition of waves
	4	6.3 Characteristics of Sound Wave (Intensity, Loudness, Pitch & Quality)
16	1	Reverberation, reverberation time, echo (Concepts only)
	2	Ultrasonic waves—Introduction and properties, engineering and medical applications of ultrasonic.
	3	Unit 7: Thermal Physics 7.1 Concept of heat and temperature
	4	Specific heats, Thermal Capacity
17	1	Latent Heat, Principle of Heat with numerical
	2	Scales of temperature and their relationships
	3	7.2 Expansion of solids
	4	Coefficient of linear, superficial and cubical expansions of solids and relation among them
18	1	7.3 Modes of heat transfer (conduction, convection and radiation with examples)
	2	Co-efficient of thermal conductivity, engineering applications
	3	REVISION
	4	REVISION
19	1	Unit-8: Optics 8.1 Laws of reflection, Laws of refraction, refractive index
	2	Image formation by spherical mirrors
	3	Mirror Formula with numerical
	4	Image formation by Lens
20	1	Lens formula with numerical
	2	Power of lens, magnification of Lens
	3	8.2 Critical angle, Total internal reflection
	4	Applications of total internal reflection
21	1	Optical fiber applications in: telecommunication, medical and sensors
	2	8.3 Optical Instrument: Simple Microscope and its magnifying Power
	3	UNIT-9: Electrostatics 9.1 Coulomb's law, unit of charge
	4	Electric field, Electric lines of force and their properties
22	1	Electric flux, Electric potential and potential difference
	2	Gauss law: Application of Gauss law to find electric field intensity of straight charged conductor
	3	Application of Gauss law to find electric field intensity of plane charged sheet
	4	9.2 Capacitance and its units
23	1	Capacitance of a Spherical conductor
	2	Parallel plate capacitor
	3	Dielectric and its effect on capacitance
	4	Series and parallel combination of capacitors (related numerical)
24	1	Unit-10: Current Electricity 10.1 Electric Current and its units, Drift Velocity and expression of Current in terms of drift Velocity
	2	Direct and alternating current
	3	Resistance and its units, Specific resistance, Conductance, Specific conductance
	4	Series and parallel combination of resistances
25	1	Effect of Temperature on Resistance
	2	10.2 Ohm's law and its verification
	3	Concept of terminal potential difference, Electromotive force (EMF) & Internal Resistance of Cell
	4	Kirchhoff's laws, Wheatstone bridge (Balanced Condition)
26	1	10.3 Joule's Law of heating effect of current
	2	Electric power, Electric energy and its units(related numerical problems).
	3	Unit-11: Magnetic Effect of Current & Electromagnetism 11.1 Coulomb's Law in Magnetism, Magnetic field and its units
	4	Magnetic intensity, magnetic lines of force and its properties
27	1	Magnetic flux and units, Intensity of magnetization
	2	Types of magnetic materials: dia, para and ferromagnetic with their properties
	3	11.2 Biota-Savart's Law, Magnetic Field due to Infinite straight conductor
	4	Magnetic Field at the Centre of a circular coil carrying current (Formula Only)

28	1	Force on moving charge in magnetic field
	2	Force on current carrying conductor placed in a magnetic Field
	3	Concept of electromagnetic induction, Faraday's Laws of Electromagnetic Induction
	4	Lenz's Law (Statement only)
29	1	11.3 Moving coil galvanometer (principle only)
	2	Conversion of a galvanometer into ammeter and voltmeter
	3	Unit-12: Semiconductor & Modern Physics 12.1 Energy bands in solids
	4	Distinguish between conductor, semi-conductor & insulator on the basis of Band Theory
30	1	Intrinsic and extrinsic semiconductors
	2	Effect of Temperature on resistivity of a Semiconductor (Concept only)
	3	p-n junction, junction diode and V-I characteristics
	4	Diode as rectifier – half wave and full wave rectifier (centre tapped)
31	1	12.2 LASER and its Properties
	2	Spontaneous and stimulated emission
	3	Population inversion, optical pumping
	4	Engineering and medical applications of lasers
32	1	Q & A DISCUSSION
	2	DOUBT CLEARING SESSION
	3	REVISION
	4	REVISION

Parag
31.07.2026
Sr. Lect. Physics