

LESSON PLAN

GOVT.POLYTECHNIC,SONEPUR

Discipline – All Branches	Year-1 st	Name of The Teaching Faculty:-MS. TAPASWINEE PATNAIK, Lect.(Stage-II) in Physics
SESSION- 2026-27	No.of days/per week-04	SUB: APPLIED PHYSICS(TH-2) Commencement of classes from date: 17/08/2026 to 17/04/2027 No. of weeks :32 (excluding vacation & Holidays)
Week	Period	TOPICS TO BE COVERED

1 ST	1 ST	Physical quantities: fundamental and derived, Units and systems of units (FPS, CGS and SI units),
	2 ND	Dimensions and dimensional formulae of physical quantities such as velocity, acceleration, force, linear momentum, kinetic energy, potential energy, work, power, pressure and density
	3 RD	Principle of homogeneity of dimensions
	4 TH	Dimensional equations and their applications (conversion from one system of units to other)
2 ND	1 ST	checking of dimensional equations
	2 ND	derivation of simple equations
	3 RD	Limitations of dimensional analysis
	4 TH	Errors in measurements (systematic and random), absolute error, relative error
3 RD	1 ST	error propagation
	2 ND	error estimation and significant figures.
	3 RD	Scalar and Vector quantities – examples, representation of vector, types of vectors
	4 TH	Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only)
4 TH	1 ST	Scalar and Vector Product, Resolution of a Vector
	2 ND	Newton's Laws of Motion, Force, Momentum
	3 RD	Statement and derivation of conservation of linear momentum
	4 TH	its applications such as recoil of gun, rockets
5 TH	1 ST	Impulse and its applications.
	2 ND	Friction: concept, types of Friction, laws of limiting friction
	3 RD	coefficient of friction, Angle of Friction, Angle of Repose
	4 TH	Methods of reducing friction and its engineering applications.
6 TH	1 ST	Work: Concept and units
	2 ND	examples of zero work, positive work and negative work
	3 RD	Energy and its units, kinetic energy
	4 TH	Work-Energy Theorem (Concepts only)
7 TH	1 ST	gravitational potential energy with examples and derivations
	2 ND	Concept of mechanical energy with examples
	3 RD	conservation of mechanical energy for freely falling bodies.

	4 TH	Power and its units
8 TH	1 ST	Power and work relationship
	2 ND	Calculation of power (numerical problems)
	3 RD	Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period
	4 TH	Relation between linear velocity and angular velocity, linear acceleration and angular acceleration
9 TH	1 ST	Solving Related numericals
	2 ND	Centripetal and Centrifugal forces with live examples
	3 RD	Expression and applications such as banking of roads, bending of cyclist
	4 TH	Translational and rotational motions with examples, Definition of torque and angular momentum and their examples
10 TH	1 ST	Conservation of angular momentum (quantitative) and its applications
	2 ND	Moment of inertia and its physical significance
	3 RD	Radius of gyration for rigid body
	4 TH	Theorems of parallel and perpendicular axes (statements only)
11 TH	1 ST	Moment of inertia of rod, disc, ring and sphere (hollow and solid); (Formulae only).
	2 ND	Solving Related numericals
	3 RD	Elasticity: definition of stress and strain, moduli of elasticity
	4 TH	Hooke's law, significance of stress-strain curve
12 TH	1 ST	Pressure: definition, units, atmospheric pressure
	2 ND	Gauge pressure, absolute pressure
	3 RD	Surface tension: concept, units
	4 TH	Cohesive and adhesive forces, angle of contact
13 TH	1 ST	Applications of surface tension
	2 ND	Viscosity and coefficient of viscosity
	3 RD	Terminal velocity, Stoke's law and effect of temperature on viscosity
	4 TH	Application in hydraulic systems
14 TH	1 ST	Hydrodynamics: Fluid motion, streamline and turbulent flow, Reynold's number, Equation of continuity
	2 ND	Bernoulli's Theorem (only formula and numerical) and its applications
	3 RD	Periodic Motion, Oscillatory Motion, Simple Harmonic Motion (SHM): definition.
	4 TH	Expression for displacement, velocity, acceleration, time period, frequency, Total Energy of a particle executing SHM
15 TH	1 ST	Free, forced and resonant vibrations with examples
	2 ND	Wave motion, transverse and longitudinal waves with examples
	3 RD	Definitions of wave velocity, frequency and wave length and their relationship
	4 TH	Wave equation, amplitude, phase, phase difference
16 TH	1 ST	Principle of superposition of waves
	2 ND	Characteristics of Sound Wave (Intensity, Loudness, Pitch & Quality)
	3 RD	Reverberation, reverberation time, echo (Concepts only)
	4 TH	Ultrasonic waves—Introduction and properties,
17 TH	1 ST	Engineering and medical applications of ultrasonic
	2 ND	Solving Wave related Numerical
	3 RD	Concept of heat and temperature,
	4 TH	Specific heats, Thermal Capacity
18 TH	1 ST	Latent Heat

19 TH	2 ND	Principle of Heat with numerical
	3 RD	Scales of temperature and their relationships
	4 TH	Expansion of solids, coefficient of linear, superficial and cubical expansions of solids
	1 ST	Relation among Expansion Co-efficients
20 TH	2 ND	Modes of heat transfer (conduction, convection and radiation with examples)
	3 RD	Co-efficient of thermal conductivity, Engineering applications.
	4 TH	Solving heat related numerical
	1 ST	Laws of reflection, Laws of refraction
21 TH	2 ND	Refractive index and numericals
	3 RD	Image formation by spherical mirrors
	4 TH	Mirror Formula with numerical
	1 ST	Image formation by Lens
22 TH	2 ND	Lens formula with numerical
	3 RD	Power of lens, magnification of Lens
	4 TH	Critical angle, Total internal reflection
	1 ST	Applications of total internal reflection, Optical fiber applications in: telecommunication, medical and sensors.
23 TH	2 ND	Optical Instrument: Simple Microscope and its magnifying Power
	3 RD	Coulomb's law, unit of charge,
	4 TH	Electric field, Electric lines of force and their properties
	1 ST	Electric flux, Electric potential and potential difference
24 TH	2 ND	Gauss law: Application of Gauss law to find electric field intensity of straight charged conductor
	3 RD	Electric field intensity of plane charged sheet
	4 TH	Capacitance and its units. Capacitance of a Spherical conductor
	1 ST	Capacitance of a parallel plate capacitor
25 TH	2 ND	Dielectric and its effect on capacitance
	3 RD	Series and parallel combination of capacitors
	4 TH	Solving Series and parallel combination of capacitors related numerical
	1 ST	Electric Current and its units, Drift Velocity and expression of Current in terms of drift Velocity
26 TH	2 ND	Direct and alternating current
	3 RD	Resistance and its units, Specific resistance, Conductance, Specific conductance
	4 TH	Series and parallel combination of resistances. Effect of Temperature on Resistance
	1 ST	Ohm's law and its verification, Concept of terminal potential difference
27 TH	2 ND	Electromotive force (EMF) & Internal Resistance of Cell.
	3 RD	Kirchhoff's laws, Wheatstone bridge (Balanced Condition)
	4 TH	Joule's Law of heating effect of current
	1 ST	Electric power, Electric energy and its units
28 TH	2 ND	Solving related Numerical Problems
	3 RD	Coulomb's Law in Magnetism, Magnetic field and its units
	4 TH	Magnetic intensity, magnetic lines of force and its properties
	1 ST	Magnetic flux and units, Intensity of magnetization
29 TH	2 ND	Types of magnetic materials: diamagnetic & paramagnetic with their properties
	3 RD	Ferromagnetic with their properties
	4 TH	Biota-Savart's Law

29 TH	1 ST	Magnetic Field due to Infinite straight conductor and at the Centre of a circular coil carrying current (Formula Only)
	2 ND	Force on moving charge in magnetic field
	3 RD	Force on current carrying conductor placed in a magnetic Field
	4 TH	Concept of electromagnetic induction, Faraday's Laws of Electromagnetic Induction, Lenz's Law (Statement only)
30 TH	1 ST	Moving coil galvanometer (principle only)
	2 ND	Conversion of a galvanometer into ammeter and voltmeter, Solving Numerical Problems
	3 RD	Energy bands in solids- Distinguish between conductor, semi-conductor & insulator on the basis of Band Theory
	4 TH	Intrinsic and extrinsic semiconductors
31 TH	1 ST	Effect of Temperature on resistivity of a Semiconductor (Concept only)
	2 ND	p-n junction, junction diode and V-I characteristics
	3 RD	Diode as rectifier – half wave rectifier
	4 TH	Full wave rectifier (centre taped).
32 TH	1 ST	LASER and its Properties
	2 ND	Spontaneous and stimulated emission
	3 RD	Population inversion, Optical pumping
	4 TH	Engineering and medical applications of lasers

Signature of Faculty

Signature of HOD

Signature of Academic Co-ordinator