STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING

SPINTRONIC TECHNOLOGY AND ADVANCE RESEARCH,BHUBANESWAR

LESSON PLAN

Faculty Name:	**MR RANJIT SAHOO**		
Subject Name:	**ENGINEERING PHYSICS**	**Course Code:**	**TH 2.a**
Year:	**2023-24**	**Semester:**	**2nd**
Branch:	**ALL**	**Course:**	**DIPLOMA**

Sl No.	Name of topics to be covered	No. of periods required	Cumulative no.of periods	Remarks
	Unit-I [UNITS & DIMENSIONS]	**03**		
1.	Physical quantities - (Definition). Definition of fundamental and derived units, systems of units (FPS, CGS, MKS and SI units).	1	1	
2.	Definition of dimension and Dimensional formulae of physical quantities.	1	1	
3.	Dimensional equations and Principle of homogeneity. Checking the dimensional correctness of Physical relations.	1	1	
	Unit-II [SCALARS & VECTORS]	**03**		
4.	Scalar and Vector quantities (definition and concept), Representation of a Vector – examples, types of vectors	1	1	
5.	Triangle and Parallelogram law of vector Addition (Statement only). Simple Numerical	1	1	
6.	Resolution of Vectors – Simple Numericals on Horizontal and Vertical components. Vector multiplication (scalar product and vector product of vectors)	1	2	
	Unit-III [KINEMATICS]	**06**		
7.	Concept of Rest and Motion. Displacement, Speed, Velocity, Acceleration & FORCE (Definition, formula, dimension & SI units).	1	1	
8.	Equations of Motion under Gravity (upward and downward motion) - no derivation.	1	1	
9.	Circular motion: Angular displacement, Angular velocity and Angular acceleration (definition, formula & SI units).	1	1	
10.	Relation between –(i) Linear & Angular velocity, (ii) Linear & Angular acceleration).	1	1	
11.	Define Projectile, Examples of Projectile. Expression for Equation of Trajectory, Time	2	2	

	of Flight, Maximum Height and Horizontal Range for a projectile fired at an angle, Condition for maximum Horizontal Range.			
	Unit-IV **[WORK & FRICTION]**	**05**		
12.	Work – Definition, Formula & SI units. Friction – Definition & Concept.	1	1	
13.	Types of friction (static, dynamic), Limiting Friction (Definition with Concept).	1	1	
14.	Laws of Limiting Friction (Only statement, No Experimental Verification). Coefficient of Friction – Definition & Formula, Simple Numericals.	2	2	
15.	Methods to reduce friction	1	1	
	Unit-V **[GRAVITATION]**	**05**		
16.	Newton's Laws of Gravitation – Statement and Explanation. Universal Gravitational Constant (G)- Definition, Unit and Dimension.	1	1	
17.	Acceleration due to gravity (g)- Definition and Concept. Definition of mass and weight.	1	1	
18.	Relation between g and G. Variation of g with altitude and depth (No derivation – Only Explanation).	2	2	
19.	Kepler's Laws of Planetary Motion (Statement only).	1	1	
	Unit-VI **[OSCILLATIONS & WAVES]**	**06**		
20.	Simple Harmonic Motion (SHM) - Definition & Examples. Expression (Formula/Equation) for displacement, velocity, acceleration of a body/ particle in SHM.	1	1	
21.	Wave motion – Definition & Concept. Transverse and Longitudinal wave motion – Definition, Examples & Comparison.	2	2	
22.	Definition of different wave parameters (Amplitude, Wavelength, Frequency, Time Period.	1	1	
23.	Derivation of Relation between Velocity, Frequency and Wavelength of a wave.	1	1	
24.	Ultrasonics – Definition, Properties & Applications.	1	1	
	Unit-VII **[HEAT & THERMODYNAMICS]**	**07**		
25.	Heat and Temperature – Definition & Difference. Units of Heat (FPS, CGS, MKS & SI).	1	1	

26	Specific Heat (concept, definition, unit, dimension and simple numerical). Change of state (concept), Latent Heat (concept, definition, unit, dimension and simple numerical).	2	2	
27	Thermal Expansion – Definition & Concept. Expansion of Solids (Concept).	1	1	
28.	Coefficient of linear, superficial and cubical expansions of Solids – Definition & Units. Relation between α, β & ϒ	1	1	
29.	Work and Heat - Concept & Relation. Joule's Mechanical Equivalent of Heat (Definition, Unit)	1	1	
	First Law of Thermodynamics (Statement and concept only)	1	1	
	Unit-VIII [OPTICS]	**04**		
30.	Reflection & Refraction – Definition. Laws of reflection and refraction (Statement only). Refractive index – Definition, Formula &Simple numerical.	1	1	
31.	Critical Angle and Total internal reflection – Concept, Definition & Explanation.	1	1	
32.	Refraction through Prism (Ray Diagram & Formula only – NO derivation).	1	1	
33.	Fiber Optics – Definition, Properties & Applications	1	1	
	Unit-IX [ELECTROSTATICS & MAGNETOSTATICS]	**07**		
34.	Electrostatics – Definition & Concept. Statement & Explanation of Coulombs laws, Definition of Unit charge.	1	1	
35.	Absolute & Relative Permittivity (ε) – Definition, Relation & Unit.	1	1	
36.	Electric potential and Electric Potential difference (Definition, Formula & SI Units). Electric field, Electric field intensity (E) – Definition, Formula & Unit. Capacitance - Definition, Formula & Unit.	1	1	
37.	Series and Parallel combination of Capacitors (No derivation, Formula for effective/Combined/total capacitance & Simple numericals).	2	2	
38.	Magnet, Properties of a magnet. Coulomb's Laws in Magnetism – Statement & Explanation, Unit Pole (Definition).	1	1	
	Magnetic field, Magnetic Field intensity (H) - (Definition, Formula & SI Unit).			

39.	Magnetic lines of force (Definition and Properties). Magnetic Flux (Φ) & Magnetic Flux Density (B) – Definition, Formula & Unit.	1	1	
	Unit-X [CURRENT ELECTRICITY]	**06**		
40.	Electric Current – Definition, Formula & SI Units. Ohm's law and its applications.	1	1	
41.	Series and Parallel combination of resistors (No derivation, Formula for effective/Combined/ total resistance & Simple numericals).	2	2	
42.	Kirchhoff's laws (Statement & Explanation with diagram).	2	2	
	Application of Kirchhoff's laws to Wheatstone bridge - Balanced condition of Wheatstone's Bridge – Condition of Balance (Equation).	1	1	
	Unit-XI [ELECTROMAGNETISM & ELECTROMAGNETIC INDUCTION]	**05**		
43.	Electromagnetism – Definition & Concept. Force acting on a current carrying conductor placed in a uniform magnetic field, Fleming's Left Hand Rule	2	2	
44.	Faraday's Laws of Electromagnetic Induction (Statement only). Lenz's Law (Statement).	1	1	
45.	Fleming's Right Hand Rule. Comparison between Fleming's Right Hand Rule and Fleming's Left Hand Rule	2	2	
	Unit-XII [MODERN PHYSICS]	**03**		
46.	LASER & laser beam (Concept and Definition). Principle of LASER (Population Inversion & Optical Pumping)	1	1	
47.	Properties & Applications of LASER.	1	1	
48.	Wireless Transmission – Ground Waves, Sky Waves, Space Waves (Concept & Definition)	1	2	

TOTAL HOURS : 60