

**JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA**

**DEPARTMENT OF MATHEMATICS & SCIENCE**

**LESSON PLAN**

**NAME OF THE FACULTY: BABITA PADHI**

**SUBJECT:ENGINEERING PHYSICS**

**SUBJECT CODE: TH-2(A)**

**SESSION: SUMMER**

**ACADEMIC YEAR: 2022-23**

**SEMESTER- 2<sup>ND</sup>**

**BRANCH:ELECTRICAL,ETC & IT**

**SECTION: E(a), E(b), T**

WEEK	PERIOD	TOPIC TO BE COVERED
1.	1.	<b>UNITS AND DIMENSIONS:</b> Introduction to physics and importance of units and dimensions
	2.	Physical quantities definition and concept, fundamental & derived units, systems of units
	3.	Definition of dimension and dimensional formulae of physical quantities, principle of homogeneity.
	4.	Dimensional equations and Principle of homogeneity. Checking the dimensional correctness of Physical relations.
2.	5.	<b>SCALARS AND VECTORS:</b> Scalar and Vector quantities, Representation of vectors, Types of vectors.
	6.	Triangle and Parallelogram law of vector Addition.
	7.	Resolution of Vectors Simple Numerical on Horizontal and Vertical components, Scalar product of vectors and properties.
	8.	Vector product and properties. Numerical from Dot and Cross products
3.	9.	<b>KINEMATICS:</b> Concept of Rest and Motion, Displacement, Speed, Velocity, Acceleration.
	10.	Force(Definition) Equations of Motion under Gravity
	11.	Simple Numerical, Circular motion, Angular displacement, Angular velocity and Angular acceleration
	12.	Relation between –Linear & Angular velocity, Linear & Angular acceleration.
4.	13.	Projectile, Equation of Trajectory, Time of Flight, Maximum Height.
	14.	Horizontal Range for a projectile fired at an angle, Condition for maximum Horizontal Range.
	15.	<b>WORK &amp; FRICTION:</b> Work – Definition, Formula & SI units, Friction – Definition & Concept
	16.	Types of friction- Static, dynamic, Limiting Friction.

5.	17.	Laws of Limiting Friction, Coefficient of Friction – Definition & Formula Simple Numerical.
	18.	Methods to reduce friction.
	19.	<b>GRAVITATION:</b> Newton's Laws of Gravitation – Statement
	20.	Gravitational Constant (G)- Definition, Unit and Dimension. Acceleration due to gravity (g).
6.	21.	Definition of mass and weight, Relation between g and G.
	22.	Variation of g with altitude and depth.
	23.	Kepler's Laws of Planetary Motion.
	24.	<b>OSCILLATIONS AND WAVES:</b> Simple Harmonic Motion (SHM) - Definition & Examples.
7.	25.	Expression for displacement, velocity, acceleration of a body/ particle in SHM
	26.	Wave motion – Definition & Concept. Transverse and Longitudinal wave motion – Definition, Examples & Comparison.
	27.	Definition of different wave parameters (Amplitude, Wavelength, Frequency, Time Period. Derivation of Relation between Velocity, Frequency and Wavelength of a wave.
	28.	Ultrasonic- Definition, Properties & Applications.
8.	29.	<b>HEAT AND THERMODYNAMICS:</b> Heat and Temperature – Definition & Difference Units of Heat, Specific Heat (concept, definition, unit, dimension)
	30.	Change of state(concept) and latent heat(concept, definition, unit, dimension) and simple numerical.
	31.	Definition & Concept of Thermal Expansion in Solids.
	32.	Coefficient of linear, superficial and cubical expansions of Solids – Definition & Units.
9.	33.	Relation between $\alpha$ , $\beta$ & $\gamma$
	34.	Work and Heat - Concept & Relation, Joule's Mechanical Equivalent of Heat
	35.	First Law of Thermodynamics.
	36.	<b>OPTICS:</b> Reflection & Refraction – Definition, Laws of reflection and refraction
10.	37.	Refractive index – Definition, Formula & Simple numerical.
	38.	Critical Angle and Total internal reflection – Concept, Refraction through Prism.
	39.	Fibre Optics – Definition, Properties & Applications. Doubt clear.
	40.	<b>ELECTROSTATICS AND MAGNETOSTATICS:</b> Electrostatics – Definition & Concept, Statement & Explanation of Coulombs laws.
11.	41.	Definition of Unit charge, Absolute & Relative Permittivity ( $\epsilon$ ).
	42.	Electric potential and Electric Potential difference ,Electric field, Electric field intensity (E) , Capacitance concept.
	43.	Series and Parallel combination of Capacitors, Formula for effective capacitance & Simple numerical).
	44.	Magnet, Properties of a magnet. Coulomb's Laws in Magnetism – Statement & Explanation, Unit Pole.
12.	45.	Definition of Magnetic field, Magnetic Field intensity (H) ,Magnetic Flux ( $\Phi$ ) & Magnetic Flux Density (B)
	46.	Definition and Properties of Magnetic lines of force.
	47.	<b>CURRENT ELECTRICITY:</b> Electric Current – Definition, Formula & SI Units. Ohm's law.
	48.	Applications of Ohm's Law. Concept of resistance.
13.	49.	Series and Parallel combination of resistors.

	50.	Problems on finding equivalent resistance from electrical circuits.
	51.	Kirchhoff's laws ( Current Law and Voltage law).
	52.	Application of Kirchhoff's laws to Wheatstone bridge - Balanced condition of Wheatstone's Bridge – Condition of Balance.
14.	53.	<b>ELECTROMAGNETISM AND ELECTROMAGNETIC INDUCTION:</b> Electromagnetism – Definition & Concept.
	54.	Force acting on a current carrying conductor placed in a uniform magnetic field.
	55.	Faraday's Laws of Electromagnetic Induction.
	56.	Lenz's Law, Fleming's Left Hand Rule, Fleming's Right Hand Rule.
15.	57.	Comparison between Fleming's Right Hand Rule and Fleming's Left Hand Rule.
	58.	<b>MODERN PHYSICS:</b> Concept and Definition of LASER & laser beam.
	59.	Principle of LASER (Population Inversion & Optical Pumping) Properties & Applications of LASER.
	60.	Wireless Transmission – Ground Waves, Sky Waves, Space Waves ( Concept & Definition).

*Phw*  
20/3/23

Signature of faculty member

*Sas*  
20/3/23  
Signature of Sr. Lecturer  
MIS  
Math & Sc.,  
Jharsiga