

**LESSON PLAN REGISTER**

**NAME OF THE FACULTY-JITENDRA KUMAR SAHOO**

**SUB: ENGG PHYSICS**

**1<sup>ST</sup> SEMESTER 2<sup>ND</sup> SEMESTER**

**BRANCH-MINING ENGG**

MONTH - AUGUST

WEEK	CLASS DAY	THEORY
		<u>UNIT-1 - DIMENSIONS and UNITS</u>
3rd	1st	Introduction and Fundamental concept of physics, Definition of physical quantities, Definition of fundamental and derived units, systems of units.
	2nd	Definition of dimension and dimensional formulae of physical quantities.
	3rd	Dimensional equations and principle of homogeneity, Checking the dimensional correctness of physical relations.
	4th	<u>UNIT-2 - SCALARS AND VECTORS</u> Scalar and vector quantities (Definition and concept), Representation of a vector, Examples, types of vectors.
4th	1st	Triangle and parallelogram law of vector addition (statement only) and Simple Numericals.

2nd Resolution of vectors - Simple numericals on horizontal and vertical components, vector multiplication (scalar product and vector product of vectors).

3rd UNIT-3, KINEMATICS  
Concept of Rest and motion.  
Displacement, speed, velocity, acceleration and force (Definition, formula, dimension and SI units)

4th Equations of motion under gravity (upward and downward motion).  
Circular motion - Angular displacement, Angular velocity and Angular acceleration (Definition, formula and SI units)

### MONTH - SEPTEMBER

1st Relation between -  
(i) linear and angular velocity  
(ii) linear and angular acceleration

2nd Define projectile, Examples of projectile.

3rd Expression for equation of trajectory, Time of flight, maximum height and horizontal range for a projectile fired at an angle.

4th Condition for maximum horizontal range.

2nd 1st UNIT-4. WORK AND FRICTION  
Work - (Definition, formula and SI units), Friction - Definition and concept.

2nd Types of friction

3rd Limiting friction - Definition and concept.

4th Laws of limiting friction, coefficient of friction - Definition, and formula. Simple numericals.

1st Methods to reduce friction.

3rd

2nd UNIT-5 - GRAVITATION  
Newton's laws of gravitation - Statement and explanation.

3rd	Universal gravitational constant ( $G$ ) - Definition, Unit and dimension.	
4th	Acceleration due to gravity ( $g$ ) - Definition and concept. Definition of Mass and Weight.	
1st	Relation between ' $g$ ' and ' $G$ '.	1018
2nd	Variation of ' $g$ ' with altitude and depth. Kepler's laws of planetary motion.	
3rd	<u>UNIT-6- OSCILLATIONS AND WAVES</u> Simple harmonic motion - Definition and Example.	
4th	Expression for displacement, velocity, acceleration of a body/particle in SHM. (Formula/equation)	
<b>MONTH - OCTOBER</b>		
1st	Wave motion - Definition and concept. Transverse and longitudinal wave motion - Definition, examples and comparison.	1028

4TH

1ST

2nd	Definition of different wave parameters (Amplitude, wavelength, frequency, Time period).	
3rd	Derivation of relation between velocity, frequency and wavelength of a wave.	
4th	Ultrasonics - Definition, properties and applications.	
1st	<u>UNIT-7 - Heat And Thermodynamics</u>	
2nd	Heat and Temperature - Definition and Difference. Units of heat (FPS, CGS, MKS & SI).	
2nd	Specific heat - Concept, definition, unit, dimension and simple numerical.	
3rd	Change of state (concept), latent heat (concept, definition, unit, dimensions and simple numerical).	
4th	Thermal Expansion - Definition & concept. Expansion of Solids.	

1st. Co-efficient of linear superficial and Cubical expansions of solids - Definition and units.

3RD 2nd Relation between  $\alpha$ ,  $\beta$  and  $\gamma$ . Work and heat - Concept and relation.

3rd Joule's mechanical equivalent of heat (Definition, unit), First law of thermodynamics (Statement and Concept)

4th UNIT-8 - OPTICS  
Reflection and refraction - Definition  
Laws of reflection and refraction.  
(Statement)

4TH 1st Refractive Index - Definition, formula & simple numerical.

2nd Critical Angle and Total internal reflection - concept, Definition and Explanation.

3rd Refraction through prism, Fiber Optics - Definition, properties and applications.

4th UNIT-9 - ELECTROSTATICS & MAGNETOSTATICS  
Electrostatics - Definition & Concept.  
Statement & explanation of Coulombs law, Definition of unit charge.

MONTH - NOVEMBER

1ST 1st Absolute & relative permittivity, Definition, relation & unit. Electropotential and Electro potential difference - Definition, formula & SI units.

2nd Electric field, Electric field intensity (E) - Definition, formula & unit. Capacitance - Definition, formula & unit.

3rd Series and parallel combination of capacitors.

4th Coulombs laws in magnetism - statement and explanation, unit pole (Definition).

2ND 1st Magnetic field, magnetic field intensity (H) - Definition, formula & SI unit. Magnetic lines of force - (Definition and properties)

2nd Magnetic flux ( $\Phi$ ) & magnetic flux density - Definition, formula & unit.

3rd UNIT-10 - CURRENT ELECTRICITY  
Electric current - Definition, formula & SI units, Ohm's law and its applications.

4th Resistance (Definition & units), Resistivity (Definition & units), conductivity - Definition, Conductance - Definition & dimensions.

3rd 1st Resistances in series, Resistances in parallel, Series and parallel combination of resistors.

2nd Simple Numericals.

3rd Kirchhoff's laws, - Statement & Explanation with diagram.

4th Application of Kirchhoff's laws to Wheatstone bridge - Balanced condition of Wheatstone's bridge.

1st UNIT-11 - ELECTROMAGNETISM & ELECTROMAGNETIC INDUCTION

4th Electromagnetism - Definition and concept. Force acting on a current carrying conductor placed in a uniform magnetic field.

2nd Faraday's laws of Electromagnetic induction (Statement), Lenz's Law (Statement)

3rd Fleming's left hand rule & Fleming's Right hand rule.

4th Comparison between Fleming's Right hand rule and Fleming's left hand rule.

1st Numericals based on Electromagnetism and Electromagnetic Induction.

5th

2nd UNIT-12 - MODERN PHYSICS  
Laser & Laser beam (concept & Definition)  
Principle of Laser (Population Inversion and Optical Pumping)

3rd Properties and Application of Laser.

4th Wireless Transmission - Ground waves, Sky waves, space waves (Definition & concept)

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