

LESSON PLAN

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| Discipline : CIVIL ENGG. | Semester : 1ST | Name of the Teaching Faculty: SOVAKARA SING & ANJALI KUJUR |
| Subject: ENGG. PHYSICS | No. of days/per week class allotted: 04 | Semester from date 16.08.2023 to 11.12.2023 No. of Weeks: 15 |

| Week | Class day | Theory/ Practical Topics |
|------|-----------|---|
| 1st | 1st | 1.1 Physical quantities - (Definition) 1.2 Definition of fundamental and derived units, systems of units (FPS, CGS, MKS and SI units). |
| | 2nd | 1.3 Definition of dimension and Dimensional formulae of physical quantities. |
| | 3rd | 1.4 Dimensional equations and Principle of homogeneity. 1.5 Checking the dimensional correctness of Physical relations. |
| | 4th | 2.1 Scalar and Vector quantities (definition and concept), Representation of a Vector – examples, types of vectors. |
| 2nd | 1st | 2.2 Triangle and Parallelogram law of vector Addition (Statement only). Simple Numerical. 2.3 Resolution of Vectors – Simple Numericals on Horizontal and Vertical components. |
| | 2nd | 2.4 Vector multiplication (scalar product and vector product of vectors). |
| | 3rd | 3.1 Concept of Rest and Motion. |
| | 4th | 3.2 Displacement, Speed, Velocity, Acceleration & FORCE (Definition, formula, dimension & SI units). 3.3 Equations of Motion under Gravity (upward and downward motion) - no derivation. |
| 3rd | 1st | 3.4 Circular motion: Angular displacement, Angular velocity and Angular acceleration (definition, formula & SI units). |
| | 2nd | 3.5 Relation between –(i) Linear & Angular velocity, (ii) Linear & Angular acceleration). |
| | 3rd | 3.6 Define Projectile, Examples of Projectile |
| | 4th | 3.7 Expression for Equation of Trajectory, Time of Flight, Maximum Height and Horizontal Range for a projectile fired at an angle, Condition for maximum Horizontal Range. |
| 4th | 1st | 4.1 Work – Definition, Formula & SI units. 4.2 Friction – Definition & Concept. |
| | 2nd | 4.3 Types of friction (static, dynamic), Limiting Friction (Definition with Concept). |
| | 3rd | 4.4 Laws of Limiting Friction (Only statement, No Experimental Verification). |
| | 4th | 4.5 Coefficient of Friction – Definition & Formula, Simple Numericals. |
| 5th | 1st | 4.6 Methods to reduce friction. |
| | 2nd | 5.1 Newton's Laws of Gravitation – Statement and Explanation. 5.2 Universal Gravitational Constant (G)- Definition, Unit and Dimension. |
| | 3rd | 5.3 Acceleration due to gravity (g)- Definition and Concept. 5.4 Definition of mass and weight. |
| | 4th | 5.5 Relation between g and G. |

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| 6th | 1st | 5.6 Variation of g with altitude and depth (No derivation – Only Explanation). |
| | 2nd | 5.7 Kepler's Laws of Planetary Motion (Statement only). |
| | 3rd | 6.1 Simple Harmonic Motion (SHM) - Definition & Examples. |
| | 4th | 6.2 Expression (Formula/Equation) for displacement, velocity, acceleration of a body/ particle in SHM |
| 7th | 1st | 6.3 Wave motion – Definition & Concept. 6.4 Transverse and Longitudinal wave motion – Definition, Examples & Comparison |
| | 2nd | 6.5 Definition of different wave parameters (Amplitude, Wavelength, Frequency, Time Period). |
| | 3rd | 6.6 Derivation of Relation between Velocity, Frequency and Wavelength of a wave |
| | 4th | 6.7 Ultrasonics – Definition, Properties & Applications. |
| 8th | 1st | 7.1 Heat and Temperature – Definition & Difference 7.2 Units of Heat (FPS, CGS, MKS & SI). |
| | 2nd | 7.3 Specific Heat (concept, definition, unit, dimension and simple numerical) 7.4 Change of state (concept), Latent Heat (concept, definition, unit, dimension and simple numerical) |
| | 3rd | 7.5 Thermal Expansion – Definition & Concept 7.6 Expansion of Solids (Concept) |
| | 4th | 7.7 Coefficient of linear, superficial and cubical expansions of Solids – Definition & Units. |
| 9th | 1st | 7.8 Relation between α , β & γ |
| | 2nd | 7.9 Work and Heat - Concept & Relation. 7.10 Joule's Mechanical Equivalent of Heat (Definition, Unit) |
| | 3rd | 7.11 First Law of Thermodynamics (Statement and concept only) |
| | 4th | 8.1 Reflection & Refraction – Definition. 8.2 Laws of reflection and refraction (Statement only) |
| 10th | 1st | 8.3 Refractive index – Definition, Formula & Simple numerical. |
| | 2nd | 8.4 Critical Angle and Total internal reflection – Concept, Definition & Explanation 8.5 Refraction through Prism (Ray Diagram & Formula only – NO derivation) |
| | 3rd | 8.6 Fiber Optics – Definition, Properties & Applications. |
| | 4th | 9.1 Electrostatics – Definition & Concept. 9.2 Statement & Explanation of Coulombs laws, Definition of Unit charge. |
| 11th | 1st | 9.3 Absolute & Relative Permittivity (ϵ) – Definition, Relation & Unit. 9.4 Electric potential and Electric Potential difference (Definition, Formula & SI Units). |
| | 2nd | 9.5 Electric field, Electric field intensity (E) – Definition, Formula & Unit. 9.6 Capacitance - Definition, Formula & Unit. |
| | 3rd | 9.7 Series and Parallel combination of Capacitors (No derivation, Formula for effective/Combined/total capacitance & Simple numericals) |
| | 4th | 9.8 Magnet, Properties of a magnet. 9.9 Coulomb's Laws in Magnetism – Statement & Explanation, Unit Pole (Definition) |

| Week | Class day | Theory/ Practical Topics |
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| 12th | 1st | 9.10 Magnetic field, Magnetic Field intensity (H) - (Definition, Formula & SI Unit). 9.11 Magnetic lines of force (Definition and Properties) |
| | 2nd | 9.12 Magnetic Flux (Φ) & Magnetic Flux Density (B) – Definition, Formula & Unit. |
| | 3rd | 10.1 Electric Current – Definition, Formula & SI Units. |
| | 4th | 10.2 Ohm’s law and its applications |
| 13th | 1st | 10.3 Series combination of resistors (No derivation, Formula for effective/Combined/ total resistance & Simple numericals) |
| | 2nd | 10.3 Parallel combination of resistors (No derivation, Formula for effective/Combined/ total resistance & Simple numericals) |
| | 3rd | 10.4 Kirchhoff’s laws (Statement & Explanation with diagram). |
| | 4th | 10.5 Application of Kirchhoff’s laws to the Wheatstone Bridge - Balanced condition of Wheatstone Bridge – Condition of balanced (Equation) |
| 14th | 1st | 11.1 Electromagnetism – Definition & Concept. |
| | 2nd | 11.2 Force acting on a current carrying conductor placed in a uniform magnetic field, Fleming’s Left Hand Rule |
| | 3rd | 11.3 Faraday’s Laws of Electromagnetic Induction (Statement only) |
| | 4th | 11.4 Lenz’s Law (Statement) 11.5 Fleming’s Right Hand Rule |
| 15th | 1st | 11.6 Comparison between Fleming’s Right Hand Rule and Fleming’s Left Hand Rule. |
| | 2nd | 12.1 LASER & laser beam (Concept and Definition) 12.2 Principle of LASER (Population Inversion & Optical Pumping) |
| | 3rd | 12.3 Properties & Applications of LASER |
| | 4th | 12.4 Wireless Transmission – Ground Waves, Sky Waves, Space Waves (Concept & Definition) |

1. Text Book of Physics for Class XI (Part-I, Part-II) N.C.E.R.T
2. Text Book of Physics for Class XII (Part-I, Part-II) N.C.E.R.T
3. Text Book of Engineering Physics by Barik, Das, Sharma, Kalyani Publisher
4. Concepts in Physics by H. C. Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi

Syllabus coverage upto I.A

Units 1,2,3,4,5,6