DEPARTMENT:MATHEMATICS AND SCIENCE

BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

LESSON PLAN

By

Mr. DILLIP KUMAR NAYAK

ACADEMIC SESSION:-2023-24

SEMESTER: -1st SEMESTER, WINTER (2023)

SUBJECT:-ENGINEERING PHYSICS (THEORY)

SECTION- C

Discipline: Civil , Automation & Robotics	**Semester:** 1st Semester	**Name of the Teaching Faculty:** DILLIP KUMAR NAYAK
Subject: Engineering Physics	**No. of Days/ per week class allotted:** 04 periods/per week (Mon, Tue, Thu, Fri)	**Semester From:** -Date: 16 / 08 / 2023 to11/ 12/2023 **No of Weeks:** - 17
Week	**Class Dates**	**Theory Topics**
1st	**17.08.23**	Introduction, Syllabus discussion and previous years related study discussion.
	18.08.23	**UNIT 1 :- UNIT AND DIMENSIONS** **1.1** Physical quantities(Definition) **1.2** Definition of fundamental and derived units, system of units(FPS,CGS,MKS and SI units)
2nd	**21.08.23**	**1.3** Definition of dimensions and Dimensional Formulae of physical quantities.
	22.08.23	**1.4** Dimensional equations and principle of homogeneity **1.5** Checking the dimensional correctness of Physical relations.
	24.08.23	**UNIT 2 :- SCALARS AND VECTORS** **2.1** Scalar and Vector quantities (definition and concept), Representation of a Vector – examples, types of vectors.
	25.08.23	**2.2** Triangle and Parallelogram law of vector Addition (Statement only). Simple Numerical.
3rd	**28.08.23**	**2.3** Resolution of Vectors – Simple Numerical on Horizontal and Vertical components.
	29.08.23	**2.4** Vector multiplication (scalar product and vectorproduct of vectors)
	31.08.23	**CLASS TEST – 01**
	01.09.23	**UNIT 3 :- KINEMATICS** **3.1** Concept of rest and Motion
4th	**04.09.23**	**3.2**Displacement, Speed, Velocity, Acceleration and Force(Definition , formula, dimensions and SI units)
	05.09.23	**3.3** Equation of Motion under Gravity (upward and downward motion)
	07.09.23	**3.4** Circular motion: Angular displacement, Angular velocity and Angular acceleration (definition, formula and SI units)
	08.09.23	**3.5** Relation between - (i) Linear and Angular Velocity, (ii) Linear and Angular acceleration

5th	11.09.23 12.09.23 14.09.23 15.09.23	**3.6** Define Projectile , Examples of Projectile **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. **CLASS TEST-02** **UNIT 4 :- WORK AND FRICTION** **4.1** Work – Definition, Formula & SI units. **4.2** Friction – Definition & Concept.
6th	18.09.23 21.09.23 22.09.23	**4.3** Types of friction (static, dynamic), Limiting Friction (Definition with Concept) **4.4**Laws of Limiting Friction (Only statement, No Experimental Verification). **4.5** Coefficient of Friction – Definition & Formula, Simple Numericals **4.6** Methods to reduce friction
7th	25.09.23 26.09.23 28.09.23	**CLASS TEST – 03** **UNIT 5:- GRAVITATION** **5.1** Newton's Laws of Gravitation -statement and explanation **5.2** Universal Gravitation Constant (G)-Definition unit and Dimensions **5.3** Acceleration due to gravity (g)- Definition and Concept **5.4** Definition of mass and weight **5.5** Relation between g and G
8th	03.10.23 05.10.23 06.10.23	**5.6** Variation of g with altitude and depth(No derivation - Only formula) **5.7**Keplers Laws of Planetary Motion(statement only) **CLASS TEST-04** **UNIT 6:- OSCILLATION AND WAVES** **6.1**Simple Harmonic Motion (SHM)-Definition and Examples
9th	09.10.23 10.10.23 12.10.23 13.10.23	**6.2** Expression (Formula/Equation) for displacement, velocity, acceleration of a body /particle in SHM **6.3** Wave motion- Definition and Concept **6.4** Transverse and Longitudinal wave motion -Definition, Examples and Comparison. **6.5** Definition of Different Wave Parameters (Amplitude, Wavelength, Frequency, Time Period) **6.6** Derivation of Relation between Velocity, Frequency and Wavelength of a Wave **6.7**Ultrasonic's- Definition , Properties , Application **CLASS TEST -05**

10th	16.10.23 17.10.23 19.10.23 20.10.23	**UNIT 7:- HEAT AND THERMODYNAMICS** **7.1** Heat and Temperature -Definition and Difference **7.2** Units of Heat (FPS,CGS,MKS, and SI) **7.3** Specific Heat(Concept, definition, unit, dimensions and simple numerical) **7.4** Change of State (concept),Latent Heat(concept, definition, unit, dimension and simple numerical) **7.5** Thermal Expansion - Definition and Concept **7.6** Expansion of Solids(concept) **7.7** Coefficient of linear, superficial and cubical expansion of solids-Definition and Units **7.8** Relation between α, β & γ
11th	30.10.23 31.10.23 02.11.23 03.11.23	**7.9** Work and Heat- concept and relation **7.10** Joules Mechanical Equivalent of Heat(Definition, Unit) **7.11** First Law of Thermodynamics (statement and concept only) **CLASS TEST- 06** **UNIT 8:-OPTICS** **8.1** Reflection & Refraction – Definition. **8.2** Laws of reflection and refraction (Statement only) **8.3** Refractive index – Definition, Formula &Simple numerical **8.4** Critical Angle and Total internal reflection – Concept, Definition & Explanation. **8.5** Refraction through Prism (Ray Diagram & Formula only – NO derivation). **8.6** Fiber Optics – Definition, Properties & Applications
12th	06.11.23 07.11.23 09.11.23 10.11.23	**CLASS TEST- 07** **UNIT9:- ELECTROSTATIC AND MAGNETOSTATIC** **9.1** Electrostatics - Definition and Concept **9.2** Statement and Explanation of Coulombs law, Definition of unit charge **9.3** Absolute and Relative Permittivity -Definition , Relation and Unit **9.4** Electric Potential and Electric Potential difference (Definition , formula and SI units) **9.5** Electric Field, Electric Field intensity (E) **9.6** Capacitance -Definition, formula and Unit **9.7** Series and Parallel combination of Capacitors (No derivation, formula for effective/combined/total capacitance and Simple numericals)
13th	13.11.23 14.11.23 16.11.23 17.11.23	**9.8** Magnet, Properties of a magnet **9.9** Coulombs Laws in Magnetism -Statement and Explanation, Unit Pole(Definition) **9.10** Magnetic field, Magnetic Field intensity (H)-Definition, formula and SI units) **9.11** Magnetic lines of Force(Definition and Properties) **9.12** Magnetic Flux and Magnetic Flux density(B)-(Definition formula and unit) **CLAS TEST- 08**

14th	20.11.23 21.11.23 23.11.23 24.11.23	**UNIT 10:- CURRENT ELECTRICITY** **10.1** Electric Current -Definition,Formula and SI units **10.2** Ohms law and it's applications **10.3** Series and Parallel Combination of resistors (No derivation, Formula for effective/combined/total resistance and simple numericals) **10.4**Kirchhoffs laws (statement and Explanation with diagram) **10.5** Application of Kirchhoffs law to Wheatstone bridge - Balanced condition of Wheatstone bridge. **CLASS TEST-09**
15th	28.11.23 30.11.23 01.12.23	**UNIT11:-ELECTROMAGNETISM & ELECTROMAGNETIC INDUCTION** **11.1** Electromagnetism -Definition and Concept **11.2** Force acting on a current carrying conductor placed in a uniform magnetic field,Fleming's left hand rule **11.3** Faradays laws of Electromagnetic Induction (statement only) **11.4**Lenzs law(statement only) **11.5** Fleming's Right Hand Rule **11.6** Comparison between Fleming's Right Hand Rule and Fleming's left hand rule **CLASS TEST -10**
16th	04.12.23 05.12.23 07.12.23 08.12.23	**UNIT -12 MODERN PHYSICS** **12.1** Laser and Laser beam (Concept and Definition) **12.2** Principle of LASER (Population Inversion and Optical Pumping) **12.3** Properties and Application of LASER **12.4** Wireless Transmission -Ground Waves ,Sky Waves,Space Waves(Concept and Definition) **REVISION AND DOUBT CLEARING** **VST -01** (For Semester Examination)
17th	11.12.23	**VST- 02**

REFERENCE BOOK:

1. CONCEPTS OF PHYSICS BY H.C. VERMA, VOL. I & II.
2. TEXT BOOK OF +2 PHYSICS (PART I, PART II) BY K.N SHARMA,N. BARIK,L.K DAS, KALYANI PUBLISHER
3. TEXT BOOK OF ENGINEERING PHYSICS BY K.N. SHARMA, Dr. BISWAMBHAR MOHANTY AND NEERAJ BANSAL, KALYANI PUBLISHER

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14/08/2023
H.O.D (Maths)