Discipline: **Mech**	Semester: 2nd	Name of the teaching faculty: **Prajna Priyadarshinee Rout**
Subject: **Engg. Physics (Th.2a)**	No. of days/week class allotted: 04	Semester from date: 28/04/2021 To date:10/07/2021 No. of weeks: 16
Week	Class Day	Theory Topics
1st	1st	Introduction to: **Engg. Physics (Th-2a) and its syllabus, Question paper pattern and motivation**
	2nd	
	3rd	Unit-1: UNIT & DIMENSIONS **Physical quantities, Units, types of units and system of units**
	4th	Unit-1: UNIT & DIMENSIONS **Dimension and dimensional formulae of physical quantities**
2nd	1st	Unit-1: UNIT & DIMENSIONS **Principle of homogeneity and application of dimensional analysis: Checking the correctness of physical relations and Numerical**
	2nd	Unit-2:SCALARS AND VECTORS **Concept of scalar and vector quantities with definition, types of vectors, Rules of vector addition: Statements of Triangle law of vector addition**
	3rd	Unit-2: SCALARS AND VECTORS **Parallelogram law of vector addition and simple numericals, Concept on Resolution of vectors with simple numerical on Horizontal and vertical components**
	4th	Unit-2: SCALARS AND VECTORS **Vector multiplication: Dot product and Cross Product with simple numericals on dot and cross products**
3rd	1st & 2nd	Unit-3: KINEMATICS **Concept of Rest and Motion with examples, Fundamental ideas on distance, displacement, speed, velocity, acceleration and force, equations of motion under gravity both for upward and downward motion**
	3rd	Unit-3: KINEMATICS **Circular motion: Conceptual idea on circular motion and terms related to circular motion such as angular displacement, angular velocity and angular acceleration.**
	4th	Unit-3: Kinematics **Derivations of Relation between- (i) Linear & angular velocity, (ii) Linear & Angular acceleration**
4th	1st & 2nd	Unit-3: KINEMATICS **Projectile motion: Definition and examples, Expression for equation of Trajectory, Time of Flight, Maximum Height and Horizontal Range for a projectile fired at an angel, condition for maximum horizontal range with simple numericals**
	3rd	Unit-4: WORK AND FRICTION **Definition of work, its formula and SI unit with simple numericals**
	4th	Unit-4: WORK AND FRICTION **Concept of friction with definition and simple examples, Types of friction**

5th	1st	Unit-4: WORK AND FRICTION **Definition with concept on limiting friction, and laws of limiting friction (statement only)**
	2nd	Unit-4: WORK AND FRICTION **Theory on Coefficient of Friction and simple numericals**
	3rd	Unit-4: WORK AND FRICTION **Methods to reduce friction with practical examples**
	4th	Unit-5: GRAVITATION **Introduction, a detail explanation on Newton's Laws of Gravitation (1st and 2nd law)**
6th	1st	Unit-5: GRAVITATION **A detail explanation on Newton's Laws of Gravitation (3rd law) and Definition of Universal Gravitational Constant (G) with its unit and dimensions**
	2nd & 3rd	Unit-5: GRAVITATION **Definition and concept of acceleration due to gravity (g), Relation between 'g' and 'G' and definition of mass and weight**
	4th &	Unit-5: GRAVITATION **Explanation (No derivation) on variation of 'g' with altitude and depth, statements on Kepler's Laws of Planetary motion**
7th	1st	
	2nd & 3rd	Unit-6: OSCILLATIONS AND WAVES **Definition and examples on Simple Harmonic Motion (SHM), expressions for displacement, velocity and acceleration of a body or particle in SHM**
	4th &	Unit-6: OSCILLATIONS AND WAVES **Wave Motion (Definition & Concept), Transverse and Longitudinal wave motion (Definition, examples and Comparison)**
8th	1st	
	2nd & 3rd	Unit-6: OSCILLATIONS AND WAVES **Wave parameters and Establish a relation between velocity, frequency and Time period, Ultrasonics-Definition, properties & Applications**
	4th	Unit-7: HEAT AND THERMODYNAMICS **Heat & temperature-Definition and difference, Units of Heat (FPS, CGS, MKS & SI)**
9th	1st & 2nd	Unit-7: HEAT AND THERMODYNAMICS **Fundamental ides on Specific heat, Change of State and Latent Heat with simple numericals**
	3rd, 4th &	Unit-7: HEAT AND THERMODYNAMICS **Concept on Thermal expansion and Coefficient of linear (α), superficial (β) and cubical (γ) expansions of Solids, Relation between α, β and γ**
10th	1st	
	2nd & 3rd	Unit-7: HEAT AND THERMODYNAMICS **Definition and Relation between Work and Heat, Joule's Mechanical Equivalent of Heat, Statement and explanation on 1st law of thermodynamics**
	4th &	Unit-8: OPTICS **Concept of Reflection and laws of Reflection, Concept of Refraction and laws of Refraction and Refractive index**
	1st	

11th		**(Definition, formula and Simple numericals)**
	2nd	Unit-8: OPTICS **Concept and Explanation of Total Internal Reflection and Critical angle**
	3rd	Unit-8: OPTICS **Definition, Properties and Applications on Fiber Optics**
	4th &	Unit-9: ELECTROSTATICS AND MAGNETOSTATICS **Concept of Electric field and Electric field intensity, Statement and Explanation of Coulomb's law and definition of Unit charge, Absolute & Relative Permittivity (Definition, Relation & Unit),**
12th	1st	
	2nd & 3rd	Unit-9: ELECTROSTATICS AND MAGNETOSTATICS **Electric potential & Electric potential difference (Definition, formula & SI units), Concept of capacitor and capacitance, Series and parallel combination of capacitors: Formula for equivalent capacitance and simple numericals**
	4th	Unit-9: ELECTROSTATICS AND MAGNETOSTATICS **Fundamental idea on magnet, Coulomb's law in magnetism and definition of Unit pole**
13th	1st	Unit-9: ELECTROSTATICS AND MAGNETOSTATICS **Definition of magnetic field and Magnetic field Intensity (H) with its formula and SI unit, Magnetic lines of force-Definition and Properties**
	2nd	Unit-9: ELECTROSTATICS AND MAGNETOSTATICS **Magnetic flux(ϕ) and Magnetic flux density (B)**
	3rd & 4th	Unit-10: CURRENT ELECTRICITY **Introduction to Electric Current, Ohm's law and its applications**
14th	1st & 2nd	Unit-10: CURRENT ELECTRICITY **Series and parallel combination of resistors: Formula for equivalent resistance and simple numericals**
	3rd	Unit-10: CURRENT ELECTRICITY **Kirchhoff's laws: Statements & Explanation with diagram**
	4th	Unit-10: CURRENT ELECTRICITY **Application of Kirchhoff's laws to Wheatstone bridge-Derivation of balance condition of Wheatstone bridge**
15th	1st & 2nd	Unit-11: ELECTROMAGNETISM AND ELECTROMAGNETIC INDUCTION **Introduction, Force acting on a current carrying conductor placed in a uniform magnetic field, Fleming's left hand rule**
	3rd & 4th	Unit-11: ELECTROMAGNETISM AND ELECTROMAGNETIC INDUCTION **Statement on Faraday's Laws of Electromagnetic Induction & Lenz's law**
	1st	Unit-11: ELECTROMAGNETISM AND ELECTROMAGNETIC INDUCTION **Fleming's Right Hand Rule, Comparison between Fleming's RHR & LHR**

16th	2nd & 3rd	Unit-12: MODERN PHYSICS **Introduction to LASER and laser beam, its principle: Population inversion & Optical Pumping**
	4th	Unit-12: MODERN PHYSICS **Concept on Wireless Transmission- Ground waves, Sky waves & Space Waves**

Signature of Concerned Faculty Signature of HOD Signature of Principal