UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY, RAYAGADA

Academic Lesson Plan for 2nd Semester – 2023 (Summer)

Name of the teaching faculty: Sri V. Naveen Kumar,
PTGF Lecturer (Physics)
Dept.: Department of Mathematics & Science
Semester: 2nd
Subject: Theory 2A : Engg. Physics
No of Periods per week: 4, Total Periods: 60,
End semester Exam: 80 Marks, Class test(I.A.): 20 Marks,
Total Marks: 100 Marks

Week	Period	Unit / Chapter	Topics to be covered
1st	1st	Unit-1 Units and Dimensions	Introduction to physical quantities, Definition of fundamental and derived units, system of units with examples
			Definition of dimension and dimensional formula of physical quantities, Dimensional equation and principle of homogeneity.
			Checking the dimensional correctness of physical relations
	2nd	Unit-2 Scalers and Vectors	Introduction to scalers and vectors quantity with definition and concepts, representation of vectors with examples
	3rd		Types of vectors , triangle and parallelogram law of vector addition with simple numerical
			Resolution of vectors , Horizontal and vertical components with simple numerical, Vector multiplication
		Unit-3 Kinematics	Concept of rest and motion, displacement, speed , velocity, acceleration and force(definition, formula, dimension and SI units)
	4th		Equation of motion under gravity(upward and downward motions)

2nd	1st		Circular motion , angular displacement, angular velocity and angular acceleration (definition, formula, dimension and SI units)
			Relation between linear and angular velocity, linear and angular acceleration
	2nd		Introduction to projectile with examples
			Expression for equation of trajectory, time of flight, maximum height and horizontal range for a projectile, condition for maximum horizontal range
	3rd	Unit-4 Work and friction	Work (definition, formula, dimension and SI units)
			Friction(definition and concepts), types of friction(static and dynamic friction)
	4th		Law of limiting friction (definition, formula, with simple numerical)
			Coefficient of friction (definition, formula, with simple numerical)
			Method to reduce friction
3rd	1st	Unit-5 Gravitation	Newton's law of gravitation(statement and explanation), universal gravitation constant G, (definition and unit and dimension)
			Acceleration due to gravity g(definition and concept)
	2nd		Definition of mass and weight
	3rd	Unit-6 Oscillation and waves	Relation between G. And g, Variation of small g with altitude and depth
			Kepler's law of planetary motion
			Simple Harmonic Motion and definition and examples

	4th		expression for displacement, velocity, acceleration of a body in SHM
4th		revision	All three units
5th	1st	Oscillations and waves	Wave motion(definition and concept),transverse and longitudinal wave motion, definition example and comparison ,
			definition of different wave parameters (amplitude, wavelength, frequency and time period)
	2nd		Relation between velocity, frequency and wavelength of a wave
			Ultrasonic (definition, properties and application)
	3rd	Unit 7- Heat and thermodynamics	Heat and temperature (definition and difference), units of heat
			specific heat(concept , definition, unit ,dimension and simple numerical
	4th		Change of state, latent heat (concept , definition, unit ,dimension and simple numerical
			1st law of thermodynamics
6th	1st	Thermal properties of matter	coefficient of linear, superficial and cubical expansion of solids(relation between alpha beta and gamma)

	2nd		work and heat concept and relation, joules mechanical equivalent of heat
	3rd		Thermal expansion(definition and concept), expansion of solids
	4th		problems
		revision	Next 3 units
		Unit-8 optics	Reflection and refraction (law of reflection and refraction
8th	1st		Refractive index (definition formula with numerical)
	2nd		Critical angle and total internal reflection (concept definition and explanation)
	3rd		Refraction through prism (ray diagram and formula), fiber optics
	4th		Problems on optics
9th	1st	Unit 9- Electrostatic	Electrostatics (definition and concepts (statements and explanation of coulumb's law, definition of unit charge
			Absolute and relative permittivity(definition and relation and unit) electric potential and electric potential difference
	2nd		Electric field , electric field intensity (definition , formula and unit)
	3rd		Capacitance definition , formula and unit), series and parallel combination of capacitors

	4th		Magnet, properties of magnet , coloumb's law in magnetism, unit pole
10th		Revision	Next 3 units
11th	1st		Magnetic field, Magnetic field intensity
	2nd		Magnetic line of force, magnetic flux and magnetic flux density (definition , properties, formula and unit)
	3rd	Unit 10- Current and electricity	Electric current (definition formula and SI Unit
	4th		Ohm's law and application , series and parallel combination of resistors
12th	1st		Kirchhoff's law
	2nd		Application of Kirchhoff 's law to Wheatstone bridge
	3rd		Balance condition of Wheatstone bridge
	4th		Condition of Balance, problems
13th	1st	Unit 11- Electromagnetism and Electromagnetic induction	Electromagnetism definition and concepts
	2nd		Force acting on a current carrying conductor placed in a uniform magnetic field , Fleming's left hand rule
	3rd		Faraday's law of electromagnetic induction
	4th		Lenz's law (concept and formula)
14th	1st		Fleming's right hand rule

	2nd		Comparison between Fleming's left and right hand rule
	3rd	Unit 12- Modern Physics	Laser and laser beam, Principle of laser, Properties of laser, application of laser
	4th		Population inversion and optical pumping, Wireless transmission(Ground wave, sky wave and space wave)
15th		revision	Next 3 units

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