

UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY, RAYAGADA**Academic Lesson Plan for 2nd Semester – 2024 (Summer)**

Name of the teaching faculty: Sri V. Naveen Kumar,

Guest Faculty, 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	1 st	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
	2 nd	Unit-2 Scalars and Vectors	Introduction to scalars and vectors quantity with definition and concepts, representation of vectors with examples
			Types of vectors , triangle and parallelogram law of vector addition with simple numerical
	3 rd	Unit-2 Scalars and Vectors	Resolution of vectors , Horizontal and vertical components with simple numerical, Vector multiplication
			Concept of rest and motion, displacement, speed , velocity, acceleration and force(definition, formula, dimension and SI units)
	4 th	Unit-3 Kinematics	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)
3rd			Method to reduce friction
	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		

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

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

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

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

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