

**UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY, RAYAGADA****Academic Lesson Plan for 2<sup>nd</sup> Semester – 2022 (Summer)**

Name of the teaching faculty: Miss. Saishmita Mishra, PTGF Lecturer (Physics)

Dept.: Department of Mathematics &amp; Science

Semester : 2<sup>nd</sup>

Subject : Theory 2A : Engg. Physics

No of Periods per week: 4,

Total Periods: 60,

End semester Exam.: 80 Marks,

Class test: 20 Marks,

Total Marks: 100 Marks

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

	2 <sup>nd</sup>		Relation between linear and angular velocity, linear and angular acceleration
	3 <sup>rd</sup>		Introduction to projectile with examples
	4 <sup>th</sup>		Expression for equation of trajectory, time of flight, maximum height and horizontal range for a projectile, condition for maximum horizontal range
4 <sup>th</sup>	1 <sup>st</sup>	Unit-4 Work and friction	Work (definition, formula, dimension and SI units)
	2 <sup>nd</sup>		Friction( definition and concepts), types of friction(static and dynamic friction)
	3 <sup>rd</sup>		Law of limiting friction (definition, formula, with simple numericals)
	4 <sup>th</sup>		Coefficient of friction (definition, formula, with simple numericals)
5 <sup>th</sup>	1 <sup>st</sup>		Method to reduce friction
	2 <sup>nd</sup>	Unit-5 Gravitation	Newtons law of gravitation(statement and explanation), universal gravitation constant G, (definition and unit and dimension)
	3 <sup>rd</sup>		Accelarion due to gravity g( definitiona and concept)
	4 <sup>th</sup>		Definition of mass and weight
6 <sup>th</sup>	1 <sup>st</sup>		relation between G. And g, Variation of small g with altitude and depth
	2 <sup>nd</sup>		Kepler's law of planetary motion
	3 <sup>rd</sup>	Unit-6 Oscillation and waves	Simple Harmonic Motion and definition and examples
	4 <sup>th</sup>		expression for displacement, velocity, acceleration of a body in SHM
7 <sup>th</sup>	1 <sup>st</sup>		Wave motion( definition and concept),transverse and longitudinal wave motion, definition , example and comparison

	2 <sup>nd</sup>		definition of different wave parameters (amplitude, wavelength, frequency and time period)
	3 <sup>rd</sup>		Relation between velocity, frequency and wavelength of a wave
	4 <sup>th</sup>		Ultrasonic (definition, properties and application)
8 <sup>th</sup>	1 <sup>st</sup>	Unit 7- Heat and thermodynamics	Heat and temperature( definition and difference), units of heat
	2 <sup>nd</sup>		specific heat( concept , definition, unit ,dimension and simple numerical
	3 <sup>rd</sup>		Change of state, latent heat (concept , definition, unit ,dimension and simple numerical
	4 <sup>th</sup>		Thermal expansion( definition and concept), expansion of solids
9 <sup>th</sup>	1 <sup>st</sup>		coefficient of linear, superficial and cubical expansion of solids( relation between alpha beta and gamma)
	2 <sup>nd</sup>		work and heat concept and relation, joules mechanical equivalent of heat
	3 <sup>rd</sup>		1st law of thermodynamics
	4 <sup>th</sup>	Unit-8 optics	Reflection and refraction ( law of reflection and refraction
10 <sup>th</sup>	1 <sup>st</sup>		Refractive index ( definition formula with numericals )
	2 <sup>nd</sup>		Critical angle and total internal reflection ( concept definition and explanation)
	3 <sup>rd</sup>		Refraction through prism (ray diagram and formula ), fiber optics
	4 <sup>th</sup>	Unit 9- Electrostatic and magnetostatic	Electrostatics ( definition and concepts ( statements and explanation of coulomb's law, definition of unit charge

11th	1 <sup>st</sup>		Absolute and relative permittivity( definition and relation and unit) electric potential and electric potential difference
	2 <sup>nd</sup>		Electric field , electric field intensity ( definition , formula and unit)
	3 <sup>rd</sup>		Capacitance definition , formula and unit), series and parallel combination of capacitors
	4 <sup>th</sup>		Magnet, properties of magnet , coloumbs law in magnetism, unit pole
12th	1 <sup>st</sup>		Magnetic field, Magnetic field intensity
	2 <sup>nd</sup>		Magnetic line of force, magnetic flux and magnetic flux density ( definition , properties, formula and unit)
	3 <sup>rd</sup>	Unit 10- Current and electricity	Electric current ( definition formula and SI Unit
	4 <sup>th</sup>		Ohm's law and application , series and parallel combination of resistors
13th	1 <sup>st</sup>		Kirchhoff's law
	2 <sup>nd</sup>		Application of Kirchhoff 's law to wheatstone bridge
	3 <sup>rd</sup>		Balance condition of Wheatstone bridge
	4 <sup>th</sup>		Condition of Balance
14th	1 <sup>st</sup>	Unit 11- Electromagnetism and Electromagnetic induction	Electromagnetism defintion and concepts
	2 <sup>nd</sup>		Force acting on a ccurrent carrying conductor placed in a uniform mgnetic field , Fleming's left hand rule
	3 <sup>rd</sup>		Faraday's law of electromagnetic induction
	4 <sup>th</sup>		Lenz's law (concept and formula )
15th	1 <sup>st</sup>		Fleming's right hand rule
	2 <sup>nd</sup>		Comparison between Fleming's left and

			right hand rule
	3 <sup>rd</sup>	Unit 12-Modern Physics	Laser and laser beam,Principle of laser,Properties of laser, application of laser
	4 <sup>th</sup>		Population inversion and optical pumping,Wireless transmission( Ground wave, sky wave and space wave)

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Revision of Unit -1 ,