UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY, RAYAGADA

Academic Lesson Plan for 2nd Semester – 2025 (Summer)

Name of teaching faculty: Sri Premanjan Padhi, Guest Faculty (Civil)
Discipline : Civil Engg. & Mechanical Engg.
Deptt: Mathematics & Science
Semester: 2nd
Subject (Theory): TH4b: Engg. Mechanics
No. of periods per week: 4   Total Periods: 60
End semester Exam: 70Marks,   Class Test(I.A): 30Marks,
Total Marks: 100Marks

Week	Period	Unit/ Chapter	Topics to be covered
1st	1	1.1	Fundamentals. Definitions of Mechanics, Statics, Dynamics,RigidBodies,
	1	1.2	Force System. Definition, Classification of force system according to plane & line of action.
	1	1.2	Characteristics of Force & effect of Force. Principles of Transmissibility & Principles of Superposition. Action & Reaction Forces & concept of Free BodyDiagram.
	1	1.3	Resolution of a Force. Definition, Method of Resolution, Typesof Component forces, Perpendicular components & non- perpendicular components.
2nd	1	1.4	Composition of Forces. Definition, Resultant Force, Method ofcomposition of forces
	1	1.4.1	Analytical Method such as Law of Parallelogram of forces &method of resolution.
	1	1.4.2	Graphical Method. Introduction, Space diagram,Vector diagram, Polygon law offorces.
	1	1.4.3	Resultant of concurrent, non-concurrent & parallel force system by Analytical & Graphical Method.
3rd	1	1.5	Moment of Force. Definition, Geometrical meaning of moment of a force, measurement of moment of a force & itsS.Iunits.
	1	1.5	Classification of moments according to direction of rotation,sign convention,
	1	1.5	Law of moments, Varignon'sTheorem
	1	1.5	Couple – Definition, S.I. units, measurement of couple
4th	1	1.5	properties of couple, simple problems on Force systems
	1	2.1	Introduction to Equilibrium, Definition, condition of equilibrium
	1	2.1	Analytical & Graphical conditions of equilibriumfor concurrent, non-concurrent & Free Body Diagram.
	1	2.2	Lami's Theorem – Statement, Application for solving

	1		variousengineering problems.
5th	1		Revision- CH-1& 2
	1	3.1	Definition of friction& Frictional forces
	1	3.1	Define Limiting frictional force & Coefficient of Friction.
	1	3.1	Define Angle of Friction & Repose & Laws of Friction
6th	1	3.1	Advantages & Disadvantages of Friction.
	1		Friction problem
	1		Friction problem
	1		Friction problem
7th	1	3.2	Equilibrium of bodies on level plane – Force applied on horizontal plane
	1		Problem solved of Force applied on horizontal plane
	1	3.2	Equilibrium of bodies on level plane – Force applied on inclinedplane
	1	3.2	Problem solved of Force applied on inclined plane
8th	1	3.3	Ladder, Wedge Friction
	1		Problems solved on Ladder friction
	1		Problems solved on Ladder friction
	1		Problems solved on wedge friction
9th	1		Revision- CH-3
	1	4.1	Introduction to centroid and CG , Application for solving various engineering problems.
	1	4.1	Centroid of geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles
	1	4.1	Centroid of composite figures,
10th	1	4.2	Problems on centroid& CG
	1	4.2	CG different engineering sections.
	1		Problems on I& T section
	1		Problems on C section & Other section
11th	1	5.1	Definition of simple machine, velocity ratio of simple and compound gear train
	1	5.1	Explain simple & compound lifting machine
	1	5.1	Define M.A, V.R.& Efficiency and State the relation between them
	1	5.1	State Law of Machine, Reversibility of Machine, Self- Locking Machine.
12th	1	5.2	Study of simple machines – simple axle & wheel
	1	5.2	Problems solved on simple axle & wheel
	1	5.2	Discussion about Single purchase crab winch
	1	5.2	Problem solved on Single purchase crab winch
13th	1	5.2	Discussion about double purchase crab winch
	1	5.2	Problems on double purchase crab winch
	1	5.2	Discussion of Worm & Worm Wheel
	1	5.2	Problems on Worm& Worm Wheel
14th	1	5.2	Screw Jack

	1	5.2	Problems solved on screw jack
	1	5.3	Types of hoisting machine-like derricks etc. Their use andworking principle
	1	5.3	Weston's differential pulley block & geared pully block
15th	1		Practice of 2024 Summer Paper
	1		Practice of 2024 Winter Paper
	1		Practice of 2023 Summer Paper
	1		Practice of 2023 Winter Paper

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