

**LESSON PLAN OF MECHANICAL ENGINEERING DEPARTMENT WINTER
2024(2023-24)**

Discipline:		Semester: 1 st	Name of Faculty: Rama Krishna Sahu	
Subject: Theory-4 Engineering Mechanics		No of Days per week class allotted	Semester From: 1 JULY 2024 to 08 November 2024	
Week	Class No	Class days	Chapter	Theory Topic
1 st	1	1 st	1	Significance and relevance of Mechanics, Applied mechanics, Statics, Dynamics
	2	2 nd		Space, time, mass, particle, flexible body and rigid body
	3	3 rd		Scalar and vector quantity, Units of measurement (SI units) - Fundamental units and derived units.
	4	4 th		Force – unit, representation as a vector and by Bow's notation
2 nd	5	1 st		characteristics and effects of a force, Principle of transmissibility of force, Force system and its classification.
	6	2 nd		Resolution of a force - Orthogonal components of a force
	7	3 rd		Moment of a force, Varignon's Theorem.
	8	4 th		Composition of forces – Resultant, analytical method for determination of resultant
3 rd	9	1 st		Law of triangle, parallelogram and polygon of forces.
	10	2 nd		Numerical
	11	3 rd		Previous Semester Question discussion
	12	4 th	2	Equilibrium and Equilibrant, Free body and Free body diagram, Analytical and graphical methods of analysing equilibrium
4 th	13	1 st		Lami's Theorem – statement and explanation, Application for various engineering problems
	14	2 nd		Numerical
	15	3 rd		Types of beam, supports (simple, hinged, roller and fixed)
	16	4 th		loads acting on beam (vertical and inclined point load, uniformly distributed load, couple),
5 th	17	1 st		Beam reaction for cantilever
	18	2 nd		Numerical
	19	3 rd		Beam reaction for simply supported beam without overhang
	20	4 th		Numerical
6 th	21	1 st		Beam reaction for simply supported beam with overhang
	22	2 nd		Numerical
	23	3 rd		Beam reaction for simply supported beam without overhang subjected to combination of Point load and uniformly distributed load
	24	4 th		Numerical
7 th	25	1 st		Beam reaction for simply supported beam with overhang subjected to combination of Point load and uniformly distributed load
	26	2 nd		Numerical
	27	3 rd		Beam reaction graphically for simply supported beam subjected to vertical point loads only.
	28	4 th		Numerical
8 th	29	1 st		Previous Semester Question discussion
	30	2 nd	3	Friction and its relevance in engineering, types
	31	3 rd		laws of friction, limiting equilibrium, limiting

				friction, co-efficient of friction
	32	4 th		angle of friction, angle of repose, relation between co-efficient of friction and angle of friction
9 th	33	1 st		Equilibrium of bodies on level surface subjected to force parallel to plane.
	34	2 nd		Numerical
	35	3 rd		Equilibrium of bodies on level surface subjected to force inclined to plane
	36	4 th		Numerical
10 th	37	1 st		Equilibrium of bodies on inclined plane subjected to force parallel to the plane only.
	38	2 nd		Numerical
	39	3 rd		Previous Semester Question discussion
	40	4 th	4	Centroid of geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter circle)
11 th	41	1 st		Centroid of composite figures composed of not more than three geometrical figures
	42	2 nd		Numerical
	43	3 rd		Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere)
	44	4 th		Centre of Gravity of composite solids composed of not more than two simple solids.
12 th	45	1 st		Numerical
	46	2 nd		Previous Semester Question discussion
	47	3 rd	5	Simple lifting machine, load, effort, mechanical advantage, applications and advantages.
	48	4 th		Velocity ratio, efficiency of machines, law of machine.
13 th	49	1 st		Ideal machine, friction in machine, maximum Mechanical advantage and efficiency
	50	2 nd		reversible and non-reversible machines, conditions for reversibility
	51	3 rd		Velocity ratios of Simple axle and wheel, Numerical
	52	4 th		Velocity ratios of Differential axle and wheel, Numerical
14 th	53	1 st		Velocity ratios of Worm and worm wheel, Numerical
	54	2 nd		Velocity ratios of Single purchase and double purchase crab winch
	55	3 rd		Numerical
	56	4 th		Velocity ratios of Simple screw jack, Numerical
15 th	57	1 st		Weston's differential pulley block
	58	2 nd		geared pulley block.
	59	3 rd		Numerical
	60	4 th		Previous Semester Question discussion



Signature of the faculty