

Discipline :	Semester :2nd (Common)	Name of the Teaching Faculty: Rashmi Ranjan Lenka
MECHANICAL ENGG		
Subject: Engg Mechanics(Th-4)	No. of days/per week class allotted: 04	Semester From Date: 29.01.2024 To Date: 14.05.2024 No of weeks- 15
Week	Class Day	Theory Topics
1st	1 st	*1.FUNDAMENTALS OF ENGINEERING MECHANICS Definitions of Mechanics, Applied Mechanics in the field of Engineering, Statics, Dynamics, Definition Rigid Bodies. Classification of force system according to plane & line of action.
	2 nd	Characteristics of Force & Effects of Force. Principles of transmissibility Force & Principles of Superposition.
	3 rd	Action & Reaction Forces & concept of Free Body Diagram, Some Examples, Definition, Method of Resolution and problem solved, Q & A Discussion as per SCTE & VT Exam Pattern.
	4 th	Types of Component forces, Perpendicular components & non-perpendicular components
2 nd	1 st	Composition of Forces, Definition, Resultant Force, Method of composition of forces, Analytical Method such as Law of Parallelogram of forces
	2 nd	Method of resolution, Introduction to Space diagram, Vector diagram, Simple problem solved.
	3 rd	Polygon law of forces, Resultant of concurrent, non-concurrent & parallel forces system by Analytical Method
	4 th	By Graphical Method.
3 rd	1 st	Moment of Force, Definition, Geometrical meaning of moment of a force
	2 nd	Measurement of moment of a force & its S.I units.
	3 rd	Classification of moments, simple problem solved
	4 th	Sign convention and Law of moments (Varignon's Theorem)
4 th	1 st	Couple – Definition, S.I. units, measurement of couple
	2 nd	Properties of couples, simple problem solved, Q & A Discussion
	3 rd	*2.EQUILIBRIUM Definition, Types of Equilibrium
	4 th	Conditions of equilibrium
5 th	1 st	Analytical & Graphical conditions of equilibrium for concurrent, non-concurrent.
	2 nd	Graphical conditions of equilibrium of non-concurrent forces Free Body Diagram
	3 rd	Lami's Theorem – Statement and Explanation
	4 th	Proof of Lami's theorem
6 th	1 st	Application of Lami's Theorem for solving various engineering problems. Q & A Discussion as per SCTE & VT Exam
	2 nd	Solving various engineering problems on Lami's theorem contd..
	3 rd	*3.FRICTION Definition of friction, Frictional forces, Limiting frictional force, Co-efficient of Friction, Examples of application of Friction
	4 th	Angle of Friction & Angle of Repose, Laws of Friction
7 th	1 st	Advantages & Disadvantages of Friction. Simple problem solved, Q & A
	2 nd	Equilibrium of bodies on level plane – Force applied on horizontal
	3 rd	And inclined plane (Up & Down)
	4 th	Ladder friction
8 th	1 st	Wedge Friction
	2 nd	Ladder friction problem solved

	3 rd	Wedge friction problem solved
	4 th	Problem solved continued..
9 th	1 st	*4.CENTROID & MOMENT OF INERTIA Centroid – Definition
	2 nd	Moment of an area about an axis
	3 rd	Centroid of some common geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles,
	4 th	Centroid of some common geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles contd..
10 th	1 st	Centroid of some composite figures, solved problems
	2 nd	Moment of Inertia — Definition, units of moment of inertia
	3 rd	Solved numerical
	4 th	Parallel axis Theorems & Perpendicular axis Theorems
11 th	1 st	Prove of parallel & perpendicular axis theorem
	2 nd	M.I. of some common plane lamina such as circle, rectangle, hollow rectangle, hollow circular section
	3 rd	M.I. of common plane lamina semi-circular, Triangular section
	4 th	Solved numerical, Q & A Discussion as per SCTE & VT Exam pattern, Monthly Class Test-2
12 th	1 st	Solved numerical, Q & A Discussion
	2 nd	Solved numerical, Q & A Discussion
	3 rd	*5.SIMPLE MACHINES Definition of simple machine, velocity ratio of simple machine, compound gear train
	4 th	Explanation of simple lifting machine, Explanation of compound lifting machine
13 th	1 st	Define M.A, V.R. & Efficiency of a lifting machine, The relation between M.A, V.R. & Efficiency of a lifting machine
	2 nd	State the Law of Machine and its equation, Reversibility of Machine, conditions for reversibility of lifting machine
	3 rd	Non-reversible machine or Self-Locking Machine, Study of simple machines–Simple wheel and axle
	4 th	Single purchase crab winch, double purchase crab winch
14 th	1 st	Worm & Worm Wheel, Screw Jack, simple problem solved
	2 nd	Types of hoisting machine-like derricks etc, their use and working principle
	3 rd	*6.DYNAMICS Kinematics & Kinetics, Principles of Dynamics, Newton’s Laws of Motion
	4 th	Motion of Particle acted upon by a constant force, Equations of motion, simple problem solved
15 th	1 st	De-Alembert’s Principle, Work, Power, Energy, & its Engineering Applications
	2 nd	Kinetic & Potential energy, its application
	3 rd	Momentum & impulse, Conservation of energy, Conservation of Linear momentum
	4 th	Collision of elastic bodies, Coefficient of Restitution, problem solved, Q & A Discussion as per SCTE & VT Exam pattern, Monthly Class Test-3, Revision of previous chapters Taught.

Books Recommended

1. Engineering Mechanics – By A.R. Basu (TMH Publication Delhi)
2. Engineering Machines –By Basudev Bhattacharya (Oxford University Press).
3. Text Book of Engineering Mechanics – R.S. Khurmi (S. Chand).
4. Applied Mechanics & Strength of Material – By I.B. Prasad.
5. Engineering Mechanics – By Timosheenko, Young & Rao.

Prepared By

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