

LESSON PLAN

Discipline: Civil Engg/Electrical Engg/E&TC Engg	Semester:2 nd (Common)	Name of the Teaching Faculty: Rashmi Ranjan Lenka
Subject: Engg Mechanics [Th-4(b)]	No. of days/per week class allotted: 04	Semester From Date: 04.02.2025 To Date: 17.05.2025 No of weeks- 15
Week	Class Day	Theory Topics
1st	1 st	*Unit – I Basics of Mechanics and Force System Significance and relevance of Mechanics, Applied Mechanics in the field of Engineering, Statics, Dynamics, Space, time, mass, particle, Definition of Rigid Bodies and flexible bodies
	2 nd	Scalar and vector quantity, Units of measurement(SI units), Fundamental units and derived units
	3 rd	Force – unit, representation as a vector and by Bow's notation
	4 th	Characteristics and effects of a force
2nd	1 st	Principle of transmissibility of force, Force system and its classification
	2 nd	Resolution of a force - Orthogonal components of a force
	3 rd	Moment of a force, its unit, classification, Varignon's Theorem
	4 th	Composition of forces – Resultant, analytical method for determination of resultant for concurrent forces,
3rd	1 st	Resultant of non-concurrent & parallel forces system by Analytical Method
	2 nd	Simple problem solved, Q & A Discussion as per SCTE & VT Exam pattern
	3 rd	Law of triangle, parallelogram and polygon of forces.
	4 th	Simple problems solved, Q & A Discussion as per SCTE & VT Exam pattern
4th	1 st	*Unit- II Equilibrium Definition, Equilibrium and Equilibrant, Free body and Free body diagram,
	2 nd	Conditions of equilibrium, Analytical and graphical methods of analyzing equilibrium
	3 rd	Lami's Theorem – statement and explanation
	4 th	Proof of Lami's theorem, Monthly Class Test-1
5th	1 st	Lami's Theorem application for various engineering problems
	2 nd	Types of beams, supports (simple, hinged, roller and fixed)
	3 rd	Loads acting on beam (vertical and inclined point load, uniformly distributed load, couple),
	4 th	Beam reaction for cantilever, simply supported beam with or without overhang
	1st	Simple problems solved, Q & A Discussion as per SCTE & VT Exam pattern

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6 th	2 nd	Beam subjected to combination of Point load and uniformly distributed load. Simple problems solved, Q & A Discussion as per SCTE & VT Exam pattern
	3 rd	
	4 th	Beam reaction graphically for simply supported beam subjected to vertical point loads only.
7 th	1 st	* Unit- III Friction Friction and its relevance in engineering, types and laws of friction
	2 nd	limiting equilibrium, limiting friction, co-efficient of friction, angle of friction, angle of repose,
	3 rd	Relation between co-efficient of friction and angle of friction, Advantages and disadvantages of friction
	4 th	Simple problems solved, Q & A Discussion as per SCTE & VT Exam
8 th	1 st	Equilibrium of bodies on level surface subjected to force horizontal to the plane
	2 nd	Simple problems solved

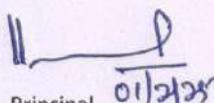
	3 rd	Equilibrium of bodies on level surface subjected to force inclined to plane
	4 th	Simple problems solved
9 th	1 st	Equilibrium of bodies on inclined plane subjected to force parallel to the plane only
	2 nd	Simple problems solved
	3 rd	* Unit- IV Centroid and Centre of Gravity Define Centre of gravity and centroid, Centroid of some common geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter circle etc.)
	4 th	Centroid of composite figures composed of not more than three geometrical figures
10 th	1 st	solved simple problems on Centre of gravity of some geometrical figure
	2 nd	Centre of Gravity of some cut-out section
	3 rd	Solved numerical on the above
	4 th	Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere etc.)
11 th	1 st	Continued...
	2 nd	Centre of Gravity of composite solids composed of not more than two simple solids.
	3 rd	Simple problems solved, Q & A Discussion as per SCTE & VT Exam pattern
	4 th	Monthly Class Test-2
12 th	1 st	* Unit - V Simple Lifting Machine Definition of machine, simple machine, Compound Machine, Load, effort of simple machine
	2 nd	Explanation of simple lifting machine, Explanation of compound lifting machine
	3 rd	Define M.A, V.R. & Efficiency of a lifting machine, The relationship between M.A, V.R. & Efficiency of a lifting machine

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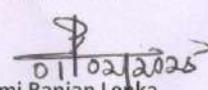
	4 th	Simple problems solved
13 th	1 st	State the Law of Machine and its equation, Reversibility of Machine, conditions for reversibility of a lifting machine
	2 nd	Explanation of non-reversible machine or Self-Locking Machine
	3 rd	Ideal machine, friction in machine. Simple problem solved
	4 th	Derive the Maximum Mechanical advantage and Maximum efficiency of a lifting machine
14 th	1 st	Simple problems solved, Q & A Discussion as per SCTE & VT Exam pattern
	2 nd	Study of simple machines with some examples, Simple wheel and axle
	3 rd	Differential wheel and axle, Single purchase crab winch and its velocity ratio
	4 th	Double purchase crab winch and its V.R.
15 th	1 st	Worm and worm wheel its V.R.
	2 nd	Weston's differential pulley block, geared pulley blocks its V.R.
	3 rd	Worm & Worm Wheel, Screw Jack, simple problem solved continued...
	4 th	Q & A Discussion as per SCTE & VT Exam pattern, Monthly Class Test-3, Revision of previous chapters Taught

Suggested Learning Resources:

1. Engineering Mechanics by Prof. Bhankhar Bharat Gokaldas (Download from <https://ekumbh.aicte-india.org/dbook.php>)
2. D.S. Bedi, Engineering Mechanics, Khanna Publications, New Delhi (2008)
3. Khurmi, R.S., Applied Mechanics, S. Chand & Co. New Delhi.
4. Bansal R K, A text book of Engineering Mechanics, Laxmi Publications.
5. Ramamrutham, Engineering Mechanics, S. Chand & Co. New Delhi.
6. Dhade, Jamadar & Walawelkar, Fundamental of Applied Mechanics, Pune Vidhyarthi Gruh.
7. Ram, H. D.; Chauhan, A. K., Foundations and Applications of Applied Mechanics, Cam-bridge University Press.
8. Meriam, J. L., Kraige, L.G., Engineering Mechanics- Statics, Vol. I, Wiley Publication, New Delhi.


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