LESSON PLAN

Discipline: **Civil Engg/Electrical Engg/E&TC Engg**	Semester: **2nd** (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	1st	***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
	2nd	Scalar and vector quantity, Units of measurement(SI units), Fundamental units and derived units
	3rd	Force – unit, representation as a vector and by Bow's notation
	4th	Characteristics and effects of a force
2nd	1st	Principle of transmissibility of force, Force system and its classification
	2nd	Resolution of a force - Orthogonal components of a force
	3rd	Moment of a force, its unit, classification, Varignon's Theorem
	4th	Composition of forces – Resultant, analytical method for determination of resultant for concurrent forces,
3rd	1st	Resultant of non-concurrent & parallel forces system by Analytical Method
	2nd	Simple problem solved, Q & A Discussion as per SCTE & VT Exam pattern
	3rd	Law of triangle, parallelogram and polygon of forces.
	4th	Simple problems solved, Q & A Discussion as per SCTE & VT Exam pattern
4th	1st	***Unit– II Equilibrium** Definition, Equilibrium and Equilibrant, Free body and Free body diagram,
	2nd	Conditions of equilibrium, Analytical and graphical methods of analyzing equilibrium
	3rd	Lami's Theorem – statement and explanation
	4th	Proof of Lami's theorem, Monthly Class Test-1
5th	1st	Lami's Theorem application for various engineering problems
	2nd	Types of beams, supports (simple, hinged, roller and fixed)
	3rd	Loads acting on beam (vertical and inclined point load, uniformly distributed load, couple),
	4th	Beam reaction for cantilever, simply supported beam with or without overhang
	1st	Simple problems solved, Q & A Discussion as per SCTE & VT Exam pattern

01/02/25

6th	2nd	Beam subjected to combination of Point load and uniformly distributed load.
	3rd	Simple problems solved, Q & A Discussion as per SCTE & VT Exam pattern
	4th	Beam reaction graphically for simply supported beam subjected to vertical point loads only.
7th	1st	* **Unit– III Friction** Friction and its relevance in engineering, types and laws of friction
	2nd	limiting equilibrium, limiting friction, co-efficient of friction, angle of friction, angle of repose,
	3rd	Relation between co-efficient of friction and angle of friction, Advantages and disadvantages of friction
	4th	Simple problems solved, Q & A Discussion as per SCTE & VT Exam
8th	1st	Equilibrium of bodies on level surface subjected to force horizontal to the plane
	2nd	Simple problems solved
	3rd	Equilibrium of bodies on level surface subjected to force inclined to plane
	4th	Simple problems solved
9th	1st	Equilibrium of bodies on inclined plane subjected to force parallel to the plane only
	2nd	Simple problems solved
	3rd	* **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.)
	4th	Centroid of composite figures composed of not more than three geometrical figures
10th	1st	solved simple problems on Centre of gravity of some geometrical figure
	2nd	Centre of Gravity of some cut-out section
	3rd	Solved numerical on the above
	4th	Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere etc.)
11th	1st	Continued...
	2nd	Centre of Gravity of composite solids composed of not more than two simple solids.
	3rd	Simple problems solved, Q & A Discussion as per SCTE & VT Exam pattern
	4th	Monthly Class Test-2
12th	1st	* **Unit – V Simple Lifting Machine** Definition of machine, simple machine, Compound Machine, Load, effort of simple machine
	2nd	Explanation of simple lifting machine, Explanation of compound lifting machine
	3rd	Define M.A, V.R. & Efficiency of a lifting machine, The relationship between M.A, V.R. & Efficiency of a lifting machine

01/02/25

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

Prepared By

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