Discipline :	Semester :2nd (Common)	Name of the Teaching Faculty: R. R. Lenka
MECHANICAL ENGG		
Subject: **ENGG MECHANICS(Th-4)**	No. of days/per week class allotted:04	Semester From Date:14.03.2022 To Date:18.06.22 No of weeks-15

Week	Class Day	Theory Topics
1st	1st	**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.
	2ND	Characteristics of Force & Effects of Force. Principles of transmissibility Force & Principles of Superposition.
	3RD	Action & Reaction Forces & concept of Free Body Diagram, Some Examples, Definition, Method of Resolution, problem solved, Q & A Discussion
	4th	Types of Component forces, Perpendicular components & non-perpendicular components
2ND	1st	Composition of Forces, Definition, Resultant Force, Method of composition of forces, Analytical Method such as Law of Parallelogram of forces
	2ND	Method of resolution, Introduction to Space diagram, Vector diagram, Simple problem solved.
	3RD	Polygon law of forces, Resultant of concurrent, non-concurrent & parallel forces system by Analytical Method
	4th	By Graphical Method.
3rd	1st	Moment of Force, Definition, Geometrical meaning of moment of a force
	2ND	Measurement of moment of a force & its S.I units.
	3RD	Classification of moments, simple problem solved
	4th	Sign convention and Law of moments (Varignon's Theorem)
4th	1st	Couple – Definition, S.I. units, measurement of couple
	2ND	Properties of couples, simple problem solved, Q & A Discussion
	3RD	**2.EQUILIBRIUM** Definition, Types of Equilibrium
	4th	Conditions of equilibrium
5th	1st	Analytical & Graphical conditions of equilibrium for concurrent, non-concurrent.
	2ND	Graphical conditions of equilibrium of non-concurrent forces Free Body Diagram
	3RD	Lami's Theorem – Statement and Explanation
	4th	Proof of Lami's theorem
6th	1st	Application of Lami's Theorem for solving various engineering problems. Q & A Discussion as per SCTE & VT Exam
	2nd	Solving various engineering problems on Lami's theorem contd..
	3rd	**3.FRICTION** Definition of friction, Frictional forces, Limiting frictional force, Co-efficient of Friction, Examples of application of Friction
	4th	Angle of Friction & Angle of Repose, Laws of Friction
7th	1st	Advantages & Disadvantages of Friction. Simple problem solved, Q & A
	2ND	Equilibrium of bodies on level plane – Force applied on horizontal
	3RD	And inclined plane (Up & Down)
	4th	Ladder friction
8th	1st	Wedge Friction
	2ND	Ladder friction problem solved

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

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.