

JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA
Department of Mechanical Engineering

Name of the Faculty: Karisma Pradhan, Akash Jal, P.P.D.	Session: Winter
Course code.: Th-04	Course Name: Engineering Mechanics
Program: Diploma	Department: Mechanical Dept.
Semester: 1st	Section: A, B&C
	Academic Year: 2023-24

Week	Periods	Unit	Hours	Topic to be Covered
1	1	1	16	Introduction to Engineering Mechanics Fundamentals
	2			Definitions of Mechanics, Statics, Dynamics, Rigid Bodies
				Force Force System. Definition, Classification of force system according to plane & line of action
				Characteristics of Force & effect of Force. Principles of Transmissibility & Principles of Superposition
3	4			Action & Reaction Forces
	5			concept of Free Body Diagram
2	6			Resolution of a Force. Definition, Method of Resolution
	7			Types of Component forces, Perpendicular components & non-perpendicular components
				8
	3			9
10				Analytical Method such as method of resolution
11				Graphical Method introduction; Space diagram, Vector diagram, Polygon law of forces
				12
13	13			Resultant of parallel force system by Analytical & Graphical Method
	14	Moment of Force. Definition, Geometrical meaning of moment of a force		

	15			measurement of moment of a force & its S.I units. Classification of moments according to direction of rotation, sign convention, Law of moments
4	16			Varignon's Theorem, Couple – Definition, S.I. units, measurement of couple, properties of couple.
	17			Definition, condition of equilibrium
5	18	2	6	Analytical & Graphical conditions of equilibrium for concurrent, non-concurrent & Free Body Diagram
	19			Analytical & Graphical conditions of equilibrium for concurrent, non-concurrent & Free Body Diagram
5	20			Lami's Theorem – Statement and conditions
	21			Application for solving various engineering problems.
	22			solving more engineering problems on Lami's theorem
	23	3	10	Definition of friction, Frictional forces
6	24			Limiting frictional force, Coefficient of Friction
	25			Angle of Friction & Repose, Laws of Friction
	26			Advantages & Disadvantages of Friction
	27			Equilibrium of bodies on level plane – Force applied on horizontal
7	28			Equilibrium of bodies on level plane -Force applied on inclined plane (up &down)
	29			Ladder friction
	30			Problems on ladder friction
	31			More Problems on ladder friction
8	32			Wedge Friction
	33	4	9	Centroid – Definition, Moment of an area about an axis
	34			centroid of geometrical figures such as squares, rectangles
	35			centroid of geometrical figures such as triangles, circles, semicircles & quarter circles
9	36			centroid of composite figures
	37			Moment of Inertia – Definition, Parallel axis
	38			Moment of Inertia by Perpendicular axis Theorems
	39			M.I. of plane lamina
10	40			M.I. of different engineering sections

11	41			Solving more problems
	42			Definition of simple machine, velocity ratio of simple and compound gear train
	43			explain simple & compound lifting machine
11	44			define M.A, V.R. & Efficiency & State the relation between them
	45			State Law of Machine, Reversibility of Machine, Self Locking Machine
	46	5	9	Study of simple machines – simple axle & whee
	47			single purchase crab winch & double purchase crab winch
12	48			Study of simple machines – Worm & Worm Wheel, Screw Jack.
	49			Solve simple problems
13	50			Practice more problems
	51			Types of hoisting machine like derricks etc, Their use and working principle
13	52			Introduction to Kinematics & Kinetics, Principles of Dynamics
	53			Newton's Laws of Motion, Motion of Particle acted upon by a constant force
	54			Equations of motion, DeAlembert's Principle
	55	6	9	Work, Power, Energy & its Engineering Applications
14	56			Kinetic & Potential energy & its application
	57			Momentum & impulse
	58			conservation of energy & linear momentum,
15	59			collision of elastic bodies, and Coefficient of Restitution.

Aal
24/9/23

Karisma Pradhan
25/09/23

B.R. Patel
22/09/23