

Lesson Plan

Discipline: Mechanical Engineering		Name of the teaching faculty: Bibekananda Rout
Subject: Engineering Mechanics		1ST Semester from 25/10/2022 to 20/02/2023
4 periods per week, total 60 periods in Semester		
CLASSES	TOPICS	WEEK
1.FUNDAMENTALS OF ENGINEERING MECHANICS [14 Periods]		1 ST
1	Fundamentals. Definitions of Mechanics, Statics, Dynamics, Rigid Bodies	
2	Fundamentals. Definitions of Mechanics, Statics, Dynamics, Rigid Bodies	
3	Force System. Definition, Classification of force system according to plane & line of action.	
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5	Characteristics of Force & effect of Force. Principles of Transmissibility	2 ND
6	Principles of Superposition. Action & Reaction Forces & concept of Free Body Diagram	
7	Resolution of a Force. Definition, Method of Resolution, Types of Component forces,	
8	Perpendicular components & non-perpendicular components.	
9	Composition of Forces. Definition, Resultant Force, Method of composition of forces	3 RD
10	Analytical Method such as Law of Parallelogram of forces & method of resolution.	
11	Graphical Method. Introduction, Space diagram, Vector diagram, Polygon law of forces	

12	Resultant of concurrent, non-concurrent & parallel force system by Analytical & Graphical Method	
13	Moment of Force. Definition & its S.I units. Classification of moments according to direction of rotation, sign convention, Law of moments	4 TH
14	Varignon's Theorem, Couple – Definition, S.I. units, measurement of couple, properties of couple.	
2.EQUILIBRIUM [8 periods]		
1	Definition, condition of equilibrium	
2	Analytical & Graphical conditions of equilibrium for concurrent, non-concurrent & Free Body Diagram	
3	Analytical & Graphical conditions of equilibrium for concurrent, non-concurrent & Free Body Diagram	5 TH
4	Analytical & Graphical conditions of equilibrium for concurrent, non-concurrent & Free Body Diagram	
5	Lamia's Theorem – Statement, Application for solving various engineering problems.	
6	Lamia's Theorem Application for solving various engineering problems.	
7	Lamia's Theorem Application for solving various engineering problems.	6 TH
8	Lamia's Theorem Application for solving various engineering problems.	
3. FRICTION[10 periods]		
1	Definition of friction, Frictional forces	
2	Limiting frictional force, Coefficient of Friction	
3	Angle of Friction & Repose, Laws of Friction	7 TH
4	Angle of Friction & Repose, Laws of Friction	
5	Advantages & Disadvantages of Friction	
6	Equilibrium of bodies on level plane	

7	Force applied on horizontal & inclined plane (up & down).	8 TH
8	Force applied on horizontal & inclined plane (up & down).	
9	Ladder, Wedge Friction.	
10	Ladder, Wedge Friction.	
4. CENTROID & MOMENT OF INERTIA [14 periods]		
1	Centroid – Definition	9 TH
2	Moment of an area about an axis, centroid of geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles	
3	Moment of an area about an axis, centroid of geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles	
4	Moment of an area about an axis, centroid of geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles	
5	Moment of an area about an axis, centroid of geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles	10 TH
6	Centroid of composite figures	
7	Centroid of composite figures	
8	Moment of Inertia – Definition	
9	Parallel axis & Perpendicular axis Theorems	11 TH
10	Parallel axis & Perpendicular axis Theorems	
11	M.I. of plane lamina & different engineering sections.	
12	M.I. of plane lamina & different engineering sections.	
13	M.I. of plane lamina & different engineering sections.	12 TH
14	M.I. of plane lamina & different engineering sections.	
5. SIMPLE MACHINES [8 periods]		
1	Definition of simple machine, velocity ratio of simple and compound gear train, explain simple & compound lifting machine	

2	Define M.A, V.R. & Efficiency & State the relation between them,	
3	State Law of Machine, Reversibility of Machine, Self-Locking Machine.	13 TH
4	Study of simple machines – simple axle & wheel, single purchase crab winch & double purchase crab winch, Worm & Worm Wheel, Screw Jack.	
5	Study of simple machines – simple axle & wheel, single purchase crab winch & double purchase crab winch, Worm & Worm Wheel, Screw Jack.	
6	Double purchase crab winch, Worm & Worm Wheel, Screw Jack.	
7	Types of hoisting machine like derricks etc., Their use and working principle.	14 TH
8	Types of hoisting machine like derricks etc., Their use and working principle.	
	4. DYNAMICS [6 Periods]	
1	Kinematics & Kinetics, Principles of Dynamics, Newton's Laws of Motion	
2	Motion of Particle acted upon by a constant force, Equations of motion, De-Alembert's Principle	
3	Work, Power, Energy & its Engineering Applications,	15 TH
4	Kinetic & Potential energy & its application.	
5	Momentum & impulse, conservation of energy & linear momentum,	
6	Collision of elastic bodies, and Coefficient of Restitution.	