

**DEPARTMENT OF MECHANICAL ENGINEERING, GOVT. POLYTECHNIC, DEOGARH**  
**LESSON PLAN FOR ACADEMIC SESSION 2023-24**

Discipline: Mining Engrg.	Semester: 1st	Name of the Teaching faculty: Meenaketan Majhi, Sr. Lect. (Mechanical)	
Subject: Engrg. Mechanics	No of Days/Week class allotted: 4 Class Day	Semester from Date: 16.08.2023	To Date: 11.12.2023 No of weeks: 15
Week		Topics	
1 <sup>st</sup>	1 <sup>st</sup>	1. FUNDAMENTALS OF ENGINEERING MECHANICS	
	2 <sup>nd</sup>	1.1 Fundamentals. Definitions of Mechanics, Statics, Dynamics, Rigid Bodies	
	3 <sup>rd</sup>	1.2 Force Force System.	
	4 <sup>th</sup>	1.3 Resolution of a Force.	
2 <sup>nd</sup>	1 <sup>st</sup>	1.4 Composition of Forces.	
	2 <sup>nd</sup>	1.4.1 Analytical Method such as Law of Parallelogram of forces & method of resolution.	
	3 <sup>rd</sup>	1.4.2. Graphical Method. Introduction, Space diagram, Vector diagram, Polygon law of forces.	
	4 <sup>th</sup>	1.4.3 Resultant of concurrent, non-concurrent & parallel force system by Analytical & Graphical Method.	
3 <sup>rd</sup>	1 <sup>st</sup>	1.5 Moment of Force. Definition, Geometrical meaning of moment of a force, measurement of moment of a force & its S.I units. Classification of Law of moments, Varignon's Theorem, Couple – Definition, S.I. units, measurement of couple, properties of couple.	
	2 <sup>nd</sup>	2. EQUILIBRIUM	
	3 <sup>rd</sup>	2.1 Definition, condition of equilibrium, Analytical & Graphical conditions of equilibrium for concurrent, non-concurrent & Free Body Diagram.	
	4 <sup>th</sup>	2.2 Lamia's Theorem – Statement, Application for solving various engineering problems.	
4 <sup>th</sup>	1 <sup>st</sup>	3. FRICTION	
	2 <sup>nd</sup>	3.1 Definition of friction, Frictional forces, Limiting frictional force, Coefficient of Friction.	
	3 <sup>rd</sup>	Angle of Friction & Repose, Laws of Friction, Advantages & Disadvantages of Friction.	
	4 <sup>th</sup>	3.2 Equilibrium of bodies on level plane – Force applied on horizontal & inclined plane (up & down).	
5 <sup>th</sup>	1 <sup>st</sup>	3.3 Ladder, Wedge Friction.	
	2 <sup>nd</sup>	4. CENTROID & MOMENT OF INERTIA	
	3 <sup>rd</sup>	4.1 Centroid – Definition, Moment of an area about an axis, centroid of geometrical figures such as squares, rectangles.	
	4 <sup>th</sup>	Centroid of Triangles, circles, semicircles & quarter circles, centroid of composite figures.	
6 <sup>th</sup>	1 <sup>st</sup>	4.2 Moment of Inertia – Definition, Parallel axis & Perpendicular axis Theorems.	
	2 <sup>nd</sup>	M.I. of plane lamina & different engineering sections	
	3 <sup>rd</sup>	5. SIMPLE MACHINES	
	4 <sup>th</sup>	5.1 Definition of simple machine, velocity ratio of simple and compound gear train, explain simple & compound lifting machine	
7 <sup>th</sup>	1 <sup>st</sup>	Define M.A, V.R. & Efficiency & State the relation between them,	
	2 <sup>nd</sup>	State Law of Machine, Reversibility of Machine, Self Locking Machine.	
	3 <sup>rd</sup>	5.2 Study of simple machines – simple axle & wheel,	
	4 <sup>th</sup>	single purchase crab winch & double purchase crab winch, Worm & Worm Wheel, Screw Jack.	
8 <sup>th</sup>	1 <sup>st</sup>	5.3 Types of hoisting machine like derricks etc, Their use and working principle. No problems.	
	2 <sup>nd</sup>	6. DYNAMICS	
	3 <sup>rd</sup>	6.1 Kinematics & Kinetics,	
	4 <sup>th</sup>	Principles of Dynamics, Newton's Laws of Motion,	
9 <sup>th</sup>	1 <sup>st</sup>	Motion of Particle acted upon by a constant force	
	2 <sup>nd</sup>	Equations of motion, DeAlembert's Principle.	
	3 <sup>rd</sup>	Work, Power, Energy & its Engineering Applications,	
	4 <sup>th</sup>	Kinetic & Potential energy & its application.	
10 <sup>th</sup>	1 <sup>st</sup>	Momentum & impulse,	
	2 <sup>nd</sup>	Conservation of energy & linear momentum,	
	3 <sup>rd</sup>	Collision of elastic bodies, and Coefficient of Restitution.	
	4 <sup>th</sup>	Numerical practice based on previous year question pattern	
11 <sup>th</sup>	1 <sup>st</sup>	Numerical practice based on previous year question pattern	
	2 <sup>nd</sup>	Numerical practice based on previous year question pattern	
	3 <sup>rd</sup>	Numerical practice based on previous year question pattern	
	4 <sup>th</sup>	Numerical practice based on previous year question pattern	
12 <sup>th</sup>	1 <sup>st</sup>	Principles of Dynamics, Newton's Laws of Motion,	
	2 <sup>nd</sup>	Motion of Particle acted upon by a constant force	
	3 <sup>rd</sup>	Equations of motion, DeAlembert's Principle.	
	4 <sup>th</sup>	Work, Power, Energy & its Engineering Applications,	
13 <sup>th</sup>	1 <sup>st</sup>	Kinetic & Potential energy	
	2 <sup>nd</sup>	Application of kinetic energy	
	3 <sup>rd</sup>	Momentum & impulse	
	4 <sup>th</sup>	Application of moment of an impulse Conservation of energy & linear momentum,	
14 <sup>th</sup>	1 <sup>st</sup>	Collision of elastic bodies,	
	2 <sup>nd</sup>	Coefficient of Restitution	
	3 <sup>rd</sup>	Application of Coefficient of Restitution & numerical problems.	
	4 <sup>th</sup>	Numerical practice based on previous year question pattern	
15 <sup>th</sup>	1 <sup>st</sup>	Numerical practice based on previous year question pattern	
	2 <sup>nd</sup>	Numerical practice based on previous year question pattern	
	3 <sup>rd</sup>	Numerical practice based on previous year question pattern	
	4 <sup>th</sup>	Numerical practice based on previous year question pattern	

Signature of the Faculty