LESSON PLAN

DEPARTMENT OF MATH & SCIENCE , ITT, CHOUDWAR

SUBJECT: ENGINEERING MECHANICS **Periods:** 4 per week

NAME OF FACULTY- G.P SAHOO **SEMESTER: 1st /** 2nd (1st year)

ACADEMIC YEAR.- 2022 -23

Semester From date: 25/10/2022 **To Date:** 31/01/2023 **No. of weeks:** 15

Week	Class Day	Theory / Practical Topics
1st	1st	**Fundamentals.** Definitions of Mechanics, Statics, Dynamics, Rigid Bodies
	2nd	**Force** Force System. Definition, Classification of force system according to plane & line of action.
	3rd	Characteristics of Force & effect of Force. Principles of Transmissibility & Principles of Superposition. Action & Reaction Forces & concept of Free Body Diagram.
	4th	**Resolution of a Force.** Definition, Method of Resolution, Types of Component forces
2nd	1st	Perpendicular components & non-perpendicular components
	2nd	Composition of Forces. Definition, Resultant Force, Method of composition of forces
	3rd	such as Analytical Method such as Law of Parallelogram of forces & method of resolution.
	4th	**Graphical Method.** Introduction, Space diagram, Vector diagram, Polygon law of forces
3rd	1st	Resultant of concurrent, non-concurrent & parallel force system by Analytical & Graphical Method.
	2nd	**Moment of Force.** Definition, Geometrical meaning of moment of a force,
	3rd	measurement of moment of a force & its S.I units.
	4th	Classification of moments according to Direction of rotation, sign convention, Law of moments, Varignon's Theorem
4th	1st	Couple Definition, S.I. units, measurement of couple, properties of couple.
	2nd	Simple problems on above
	3rd	Simple problems on above
	4th	Revision
5th	1st	**EQUILIBRIUM** Definition, condition of equilibrium,
	2nd	Analytical & Graphical conditions of equilibrium for concurrent, non-concurrent & Free Body Diagram
	3rd	Lamia's Theorem – Statement, Application for solving various engineering problems.
	4th	Simple problems on above
6th	1st	Simple problems on above
	2nd	Revision
	3rd	**FRICTION** Definition of friction, Frictional forces, Limiting frictional force,
	4th	Coefficient of Friction. Angle of Friction & Repose,
7th	1st	Laws of Friction, Advantages & Disadvantages of Friction.

	2nd	Equilibrium of bodies on level plane – Force applied on horizontal & inclined plane (up &down).
	3rd	Ladder, Wedge Friction.
	4th	Simple problems on above
8th	1st	Simple problems on above
	2nd	Revision
	3rd	**CENTROID & MOMENT OF INERTIA** Centroid – Definition, Moment of an area about an axis, centroid of geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles, centroid of composite figures
	4th	Moment of Inertia – Definition, Parallel axis & Perpendicular axis Theorems
9th	1st	M.I. of plane lamina & different engineering sections.
	2nd	Simple problems on above
	3rd	Simple problems on above
	4th	Revision
10th	1st	**SIMPLE MACHINES** Definition of simple machine, velocity ratio of simple and compound gear train,
	2nd	explain simple & compound lifting machine
	3rd	Define M.A, V.R. & Efficiency & State the relation between them,
	4th	State Law of Machine, Reversibility of Machine, Self-Locking Machine.
11th	1st	Simple problems on above
	2nd	Simple problems on above
	3rd	Study of simple machines simple axle & wheel, single purchase crab winch & double purchase crab winch.
	4th	Worm & Worm Wheel, Screw Jack
12th	1st	Types of hoisting machine like derricks etc., Their use and working principle.
	2nd	Revision
	3rd	Revision
	4th	Solve simple problems
13th	1st	DYNAMICS Kinematics & Kinetics, Principles of Dynamics
	2nd	Newton's Laws of Motion, Motion of Particle acted upon by a constant force
	3rd	Equations of motion,
	4th	DeAlembert's Principle.
14th	1st	Work, Power, Energy & its Engineering Applications
	2nd	Kinetic & Potential energy & its application
	3rd	Momentum & impulse, conservation of energy & linear momentum,
	4th	collision of elastic bodies, and Coefficient of Restitution.
15th	1st	Solve simple problems
	2nd	Solve simple problems
	3rd	Revision
	4th	Revision