SYNERGY SCHOOL OF ENGINEERING,DHENKANAL

LESSON PLAN

Session (2026-2027)

Discipline: 1st year Diploma Engg. Common to All Branches	**Name of the Teaching Faculty:** Mr. Mihir Kumar Swain, (Lecturer) **Email ID:** rmihirswain13@gmail.com	
Subject: Engineering Mechanics, Theory-7	**No. of Days/Week:** 02	**Start Date: 17/08/2026** **End Date: 17/04/2027**

Week	Class Day	Theory Topics
1st	1st	**Unit-1: Introduction to Mechanics** Significance and relevance of Mechanics, Applied mechanics, Statics, Dynamics, Space, time, mass, particle, flexible body and rigid body.
	2nd	Scalar and vector quantity, Units of measurement (SI units), Fundamental units and derived units.
2nd	1st	Force – unit, representation as a vector and by Bow's notation
	2nd	Characteristics and effects of a force, Principle of transmissibility of force.
3rd	1st	**Unit-2 Force System** Force system and its classification.
	2nd	Resolution of a force - Orthogonal components of a force
4th	1st	Moment of a force, Law of moment, Varignon's Theorem, Couple and it's moment.
	2nd	Simple numerical on resolution & moments
5th	1st	Composition of forces, Resultant force
	2nd	Analytical method for determination of resultant for concurrent, non-concurrent and parallel co-planar force system
6th	1st	Simple numerical on composition
	2nd	Triangle Law of forces and Polygon Law of forces (Statement Only), Parallelogram law of Forces (Statement and Derivation)
7th	1st	Simple numerical on triangle law
	2nd	Simple numerical using parallelogram and polygon law
8th	1st	**Unit-3 Equilibrium** Equilibrium and Equilibrant, Condition of Equilibrium
	2nd	Free body and Free body diagram
9th	1st	Simple Numerical on above.
	2nd	Analytical and graphical methods of analysing equilibrium
10th	1st	Lami's Theorem – Statement and Explanation
	2nd	Application for various engineering problems.
11th	1st	Simple Numerical on equilibrium.

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25/7/26

	2nd	Beam: Types of Loads, Beam, Supports with their Reactions with neat sket...
12th	1st	Finding support reaction: Simple Numerical .
	2nd	Simple Numerical on beams with different loading

13th	1st	**Unit-4: Friction** Friction and its relevance in engineering, types of friction
	2nd	Laws of friction, limiting equilibrium, limiting friction, co-efficient of friction, angle of friction, angle of repose
14th	1st	Relation between co-efficient of friction and angle of friction
	2nd	Numerical using coefficient of friction
15th	1st	Equilibrium of bodies in level plane with load acting parallel & at an angle to plane
	2nd	Equilibrium of bodies on inclined plane subjected to force parallel to the plane
16th	1st	Ladder Friction
	2nd	Numerical on ladder friction
17th	1st	**Unit:5 Centroid and Centre of Gravity** Definition of Centroid, Centroid of geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter circle)
	2nd	Definition of Centroid, Centroid of geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter circle)
18th	1st	Centroid of composite figures composed of not more than three geometrical figures.
	2nd	Centroid of composite figures composed of not more than three geometrical figures.
19th	1st	Locate centroid of C, I section
	2nd	Locate centroid of L and T Section.
20th	1st	Definition of Centre of Gravity (C.G.), Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere) (Expression Only
	2nd	Definition of Centre of Gravity (C.G.), Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere) (Expression Only
21st	1st	Solve numerical
	2nd	Solve numerical
22nd	1st	**Unit:6 Moment of Inertia** Definition of Moment of Inertia (M.I.), M.I. of Plane Figures- rectangle, square, triangle, circle, semicircle. (Only Expression)
	2nd	Parallel Axis Theorem (Statement and Proof)
23rd	1st	Solve numerical
	2nd	Perpendicular Axis Theorem (Statement and Proof)
24th	1st	Determination of Moment of Inertia of Composite Section (I and T-Section).
	2nd	Solve more numerical on above

25th	1st	**Unit:7 Simple Lifting Machine** Simple lifting machine, load, effort, mechanical advantage, Velocity ratio (V.R.), efficiency of machines, Applications and advantages
	2nd	Solve numerical
26th	1st	Law of machine, Ideal machine, friction in machine, maximum Mechanical advantage and efficiency
	2nd	Solve numerical
27th	1st	Reversible and non-reversible machines, conditions for reversibility
	2nd	Solve numerical
28th	1st	Determination of MA, VR and Efficiency of Simple Axle and wheel, Differential Axle and Wheel
	2nd	Determination of MA, VR and Efficiency of Worm and worm wheel
29th	1st	Determination of MA, VR and Efficiency of Single purchase and double purchase crab winch
	2nd	Determination of MA, VR and Efficiency of Simple Screw Jack
30th	1st	Determination of MA, VR and Efficiency of 1st, 2nd and 3rd System of Pulleys
	2nd	Simple Numerical on above.
31st	1st	**Unit:8 Gear and Gear Train** Gear, Gear Drive, Types of Gear Drive
	2nd	Gear Train, Types of Gear Train
32nd	1st	Velocity Ratio of Simple and Compound Gear Train
	2nd	Numerical on Simple and Compound Gear Train

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