NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: ENGINEERING MECHANICS(TH-4)

Name Of The Faculty :- Er. ABHILIPSA DAS
Branch :-AE/CE/ME
Session :- 2024-25
Semester :- 2nd
Examination :- 2025 (S)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of periods actually needed
1	Unit – I Basics of mechanics and force system	14
2	Unit– II Equilibrium	13
3	Unit– III Friction	9
4	Unit– IV Centroid and centre of gravity	11
5	Unit – V Simple lifting machine	9
	Total Period:	60

A. Das 31.1.2025
Sign of Faculty

31.01.25
Sign of H.O.D.

Discipline:AE/ CE/ME	Semester: 2nd	**Name of the Teaching Faculty:** Er. ABHILIPSA DAS
		SESSION : 2024-25 **EXAMINATION :** 2025 (S)
Week	**Class Day**	**Topics to be Covered**
1st	1st	**Basics of mechanics and force system** Significance and relevance of Mechanics, Applied mechanics, Statics, Dynamics.
	2nd	Space, time, mass, particle, flexible body and rigid body.
	3rd	Scalar and vector quantity, Units of measurement (SI units) - Fundamental units and derived units
	4th	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	Force system and its classification.
	4th	Resolution of a force - Orthogonal components of a force
3rd	1st	moment of a force, Varignon's Theorem.
	2nd	Composition of forces – Resultant, analytical method for determination of resultant for concur- rent, non-concurrent and parallel co-planar force systems –
	3rd	Composition of forces – Resultant, analytical method for determination of resultant for concur- rent, non-concurrent and parallel co-planar force systems –
	4th	Law of triangle, parallelogram and polygon of forces.
4th	1st	Law of triangle, parallelogram and polygon of forces.
	2nd	Law of triangle, parallelogram and polygon of forces.
	3rd	**Equilibrium** Equilibrium and Equilibrant, Free body and Free body diagram
	4th	Analytical and graphical meth- ods of analysing equilibrium
5th	1st	Lami's Theorem – statement and explanation, Application for various engineering problems.
	2nd	Lami's Theorem – statement and explanation, Application for various engineering problems.
	3rd	Types of beam, supports (simple, hinged, roller and fixed) and loads acting on beam (vertical and inclined point load, uniformly distributed load, couple)
	4th	Types of beam, supports (simple, hinged, roller and fixed) and loads acting on beam (vertical and inclined point load, uniformly distributed load, couple)
6th	1st	Types of beam, supports (simple, hinged, roller and fixed) and loads acting on beam (vertical and inclined point load, uniformly distributed load, couple)

Week	Class Day	Topics to be Covered
6th	2nd	Beam reaction for cantilever, simply supported beam with or without overhang – subjected to combination of Point load and uniformly distributed load.
	3rd	Beam reaction for cantilever, simply supported beam with or without overhang – subjected to combination of Point load and uniformly distributed load.
	4th	Beam reaction for cantilever, simply supported beam with or without overhang – subjected to combination of Point load and uniformly distributed load.
7th	1st	Beam reaction graphically for simply supported beam subjected to vertical point loads only.
	2nd	Beam reaction graphically for simply supported beam subjected to vertical point loads only.
	3rd	**FIRST INTERNAL ASSESSMENT**
	4th	**FIRST INTERNAL ASSESSMENT**
8th	1st	**Friction** Friction and its relevance in engineering, co-efficient of friction,
	2nd	Types and laws of friction, limiting equilibrium, limiting friction
	3rd	Types and laws of friction, limiting equilibrium, limiting friction
	4th	co-efficient of friction, angle of friction,
9th	1st	Angle of repose, relation between co-efficient of friction and angle of friction.
	2nd	Equilibrium of bodies on level surface subjected to force parallel and inclined to plane.
	3rd	Equilibrium of bodies on level surface subjected to force parallel and inclined to plane.
	4th	Equilibrium of bodies on inclined plane subjected to force parallel to the plane only.
10th	1st	Equilibrium of bodies on inclined plane subjected to force parallel to the plane only.
	2nd	Equilibrium of bodies on inclined plane subjected to force parallel to the plane only.
	3rd	**Centroid and centre of gravity** Centroid of geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter circle)
	4th	Centroid and centre of gravity Centroid of geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter circle)
11th	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.
	3rd	Centroid of composite figures composed of not more than three geometrical figures.

Week	Class Day	Topics to be Covered
11th	4th	Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere) Centre of Gravity of composite solids composed of not more than two simple solids
12th	1st	Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere) Centre of Gravity of composite solids composed of not more than two simple solids
	2nd	Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere) Centre of Gravity of composite solids composed of not more than two simple solids
	3rd	Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere) Centre of Gravity of composite solids composed of not more than two simple solids
	4th	NUMERICALS SOLVED.
13th	1st	NUMERICALS SOLVED.
	2nd	**SECOND INTERNAL ASSESSMENT**
	3rd	**SECOND INTERNAL ASSESSMENT**
	4th	**Simple lifting machine** Simple lifting machine, load, effort
14th	1st	Mechanical advantage, applications and advantages.
	2nd	Velocity ratio, efficiency of machines, law of machine.
	3rd	Velocity ratio, efficiency of machines, law of machine.
	4th	Ideal machine, friction in machine, maximum Mechanical advantage and efficiency, reversible and non-reversible machines, conditions for reversibility
15th	1st	Ideal machine, friction in machine, maximum Mechanical advantage and efficiency, reversible and non-reversible machines, conditions for reversibility
	2nd	Velocity ratios of Simple axle and wheel, Differential axle and wheel, Worm and worm wheel, Single purchase and double purchase crab winch.
	3rd	Simple screw jack, Weston's differential pulley block, geared pulley block.
	4th	Simple screw jack, Weston's differential pulley block, geared pulley block.

A. Das
31.01.2025

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