GOVERNMENT POLYTECHNIC, BALASORE

Government of Odisha

ସରକାରୀ ବହୁବୃତ୍ତି ଅନୁଷ୍ଠାନ, ବାଲେଶ୍ୱର

ACADEMIC LESSON PLAN FOR 2024-25(W)

Discipline: E&TC	**Semester:1st**	**Name of the Teaching Faculty : Janmejay Rout**
Subject: ENGINEERING MECHANICS	**No of Days /Per week class allotted**	**Semester from 2024-25(W)** 16.08.24 **No of week:15**
Week	**Class day**	**Theory/Practical topics**
1St	**1st**	Basic of Mechanics and force System, definition, concepts
	2nd	Significance and relevance of Mechanics
	3rd	Applied mechanics, Statics, Dynamics.
	4th	Space, time, mass, particle, flexible body and rigid body
2nd	1st	Scalar and vector quantity, Units of measurement (SI units) - Fundamental units and derived units.
	2nd	Force – unit, representation as a vector and by Bow's notation
	3rd	Characteristics and effects of a force, Principle of transmissibility of force, Force system and its classification
	4th	Resolution of a force - Orthogonal components of a force, moment of a force,
3rd	1st	Avignon's Theorem.
	2nd	Composition of forces – Resultant,
	3rd	Analytical method for determination of resultant for concurrent
	4th	Non-concurrent and parallel co-planar force systems
4th	1st	Law of triangle
	2nd	Parallelogram
	3rd	Polygon of forces.
	4th	Problem on above theory
5th	1st	Equilibrium, Equilibrium and Equilibrant, Free body and Free body diagram
	2nd	Analytical and graphical methods of analysing equilibrium
	3rd	Lami's Theorem – statement and explanation
	4th	Application for various engineering problems.
6th	**1st**	Types of beam, supports (simple, hinged, roller and fixed)
	2nd	Loads acting on beam (vertical and inclined point load, uniformly distributed load, couple),
	3rd	Beam reaction for cantilever with problem solved
	4th	Simply supported beam with or without overhang with problem solved
7th	1st	SSB subjected to combination of Point load and uniformly distributed load.
	2nd	Beam reaction graphically for simply supported beam subjected to vertical point loads only.
	3rd	Beam reaction graphically for simply supported beam subjected to vertical point loads only.
	4th	-do-

8th	1st	Friction, Friction and its relevance in engineering, types and laws of friction
	2nd	Limiting equilibrium, limiting friction, co-efficient of friction, angle of friction, angle of repose
	3rd	Relation between co-efficient of friction and angle of friction.
	4th	Equilibrium of bodies on level surface subjected to force parallel to plane
9th	**1st**	Equilibrium of bodies on level surface subjected to force inclind to plane
	2nd	Problem solved on above theory
	3rd	Problem solved on above theory
	4th	Equilibrium of bodies on inclined plane subjected to force parallel to the plane only.
10th	1st	Problem solved on above concept on friction
	2nd	Problem solved on above theory .
	3rd	Problem solved on above theory
	4th	Problem solved on above theory
11th	1st	**Centric and Center of Gravity- introduction to centric and center of gravity**
	2nd	Centroid of geometrical plane figures (square, rectangle)
	3rd	Centroid of geometrical plane figures(triangle, circle, semi-circle, quarter circle)
	4th	Centroid of composite figures composed of not more than three geometrical figures
12th	**1st**	**-do-**
	2nd	Centre of Gravity of simple solids (Cube, cuboids)
	3rd	Centre of Gravity of simple solids cone, cylinder
	4th	Centre of Gravity of simple solids sphere, hemisphere
13th	1st	Centre of Gravity of composite solids composed of not more than two simple solids.
	2nd	-do-
	3rd	Simple Lifting Machine- introduction and description about it.
	4th	load, effort, mechanical advantage, applications
14th	1st	advantages. Velocity ratio, efficiency of machines, law of machine.
	2nd	Ideal machine, friction in machine, , maximum Mechanical advantage and efficiency
	3rd	Reversible and non-reversible machines, conditions for reversibility
	4th	Velocity ratios of Simple axle and wheel, Differential axle and wheel
15th	1st	Worm and worm wheel, Single purchase and double purchase crab winch,
	2nd	Simple screw jack,
	3rd	Weston's differential pulley block,
	4th	Geared pulley block. And problem solved on it.

SIGN OF FACULTY
(Janmejay Rout)