

GOVERNMENT POLYTECHNIC JAJPUR

A/ P: Ragadi, Block: Korei, Dist.: Jajpur, Odisha- 755019

Website: <https://www.gpJajpur.org> E-mail: principalgpjajpur@yahoo.co.in Contact: 9437155107

DEPARTMENT OF MECHANICAL ENGINEERING (2024-2025)

LESSON PLAN

Discipline: Civil Engg	Semester: 1st	Name of the Teaching faculty: JAYADEB DASH		
Subject: ENGINEERING MECHANICS	No of Days /Week class allotted: 4	Semester from Date: 16/08/2024 No of weeks: 15	To Date: 10/12/2024	
1ST	1st	Basics of mechanics and force system. (Chapter-1)		
		Explanation Significance and relevance of Mechanics		
		Defining Applied mechanics, Statics, Dynamics.		
	2nd	Defining Space, time, mass, particle, flexible body and rigid body.		
		Defining Scalar and vector quantity, Units of measurement (SI units) - Fundamental units and derived units.		
	3rd	Describing Force – unit, representation as a vector and by Bow's notation		
		Discussing characteristics and effects of a force, Principle of transmissibility of force		
	4th	Describing Force System.		
		Explaining Definition, Classification of force system according to plane & line of action.		
		discussing Characteristics of Force & effect of Force.		
		discussing Principles of Transmissibility & Principles of Superposition.		
	2ND	1st	Expalin Resolution of a Force.	
Stating definition, Method of Resolution, Types of Component forces, Perpendicular components & non-perpendicular components.				
2nd		discussing composition of Forces.		
		State Definition, Resultant Force, Method of composition of forces		
		discussing analytical Method such as Law of Parallelogram of forces & method of resolution.		
3rd		Numerical solving related to Parallelogram Law of Force.		
		State Graphical Method - Introduction, Space diagram, Vector diagram, Polygon law of forces.		
4th		discussing Resultant of concurrent, non-concurrent & parallel force system by Analytical & Graphical Method.		
		Numerical solving using method of resolution of forces to find a resultant force.(Analytical Method)		
3RD		1st	Numerical solving class using method of resolution of forces to find a resultant force.(Analytical Method)	
		2nd	Numerical solving class using method of resolution of forces to find a resultant force.(Graphical Method)	
		3rd	Demonstrating Moment of Force.	
	Explaining Definition of Moment of force, Geometrical meaning of moment of a force, measurement of moment of a force & its S.I units.			
		Explaining Classification of moments according to direction of rotation, sign convention.		

	4th	Describing Law of moments, Varignon's Theorem of moments. Describing Applications of moments. discussing Analytical method for finding position of the resultant force by moments.
4TH	1st	Numerical solving class based on law of moments to find the force.
	2nd	Numerical solving class based on Varignon's Principle of moments to find magnitude and position of the resultant force.
		discussing Couple – Definition, moment of a couple classification, S.I. units, measurement of couple, properties of couple.
	3rd	Numerical solving class based on couple to find magnitude of the couple.
4th	CLASS TEST-I	
5TH		EQUILIBRIUM. (Chapter-2)
	1st	State Equilibrium and Equilibrant, Free body and Free body diagram, Analytical and graphical methods of analysing equilibrium.
	2nd	Describing Lamia's Theorem – Statement and its proof.
	3rd	Defining Application of lamis theorem for various engineering problems
	4th	Numerical solving class by the application of Lami's Theorem for solving various engineering problems. (String problems)
6TH	1st	Numerical solving class by the application of Lami's Theorem for solving various engineering problems. (String problems)
	2nd	Classifying Types of beam
	3rd	discussing supports (simple, hinged, roller and fixed) and
	4th	Defining loads acting on beam (vertical and inclined point load, uniformly distributed load, couple),
7TH	1st	Expalin Beam reaction for cantilever, simply supported beam with or without overhang – subjected to combination of Point load and uniformly distributed load.
	2nd	Explaining Beam reaction for cantilever, simply supported beam with or without overhang – subjected to combination of Point load and uniformly distributed load.
	3rd	Explaining Beam reaction graphically for simply supported beam subjected to vertical point loads only
	4th	Solving Numericals on them
8TH	1st	Solving Numericals on them
	2nd	Solving Numericals on them
		FRICITION. (Chapter-3)
	3rd	Defining Definition of friction, Frictional forces, Limiting frictional force, Coefficient of Friction, Angle of Friction & Repose, relation between co-efficient of friction and angle of friction
	4th	State Laws of Friction, Advantages & Disadvantages of Friction.
7TH	1st	plane.
	2nd	Numerical solving on friction of a body on rough horizontal plane.
	3rd	Numerical solving on friction of a body on rough horizontal plane.
	4th	Defining Equilibrium of bodies on inclined plane subjected to force parallel to the plane only.

8TH	1st	Numerical solving on friction of a body on rough inclined plane subjected to a force acting along the inclined plane.
	2nd	Numerical solving on friction of a body on rough inclined plane subjected to a force acting along the inclined plane.
	3rd	Previous year questions solving class on Friction.
	4th	Centroid and centre of gravity (Chapter-4) Expalin Centroid of geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter circle)
9TH	1st	discussing Centroid of composite figures composed of not more than three geometrical figures
	2nd	discussing Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere)
	3rd	Describing Centre of Gravity of composite solids composed of not more than two simple solids.
	4th	Describing Centre of gravity of Plane Figures. (such as T-section, I-section, L-section etc.)
10TH	1st	Describing Centre of gravity of symmetrical sections. (such as T-section, C-section, I-section)
	2nd	Numerical solving on centre of gravity of above symmetrical sections.
	3rd	Numerical solving on centre of gravity of above symmetrical sections.
	4th	Numerical solving on centre of gravity of above symmetrical sections.
11TH	1st	Revision and doubt clearing class on C.G.
	2nd	Previous year questions solving class on CG.
	3rd	CLASS TEST-II
	4th	SIMPLE LIFTING MACHINES. (Chapter-5)
12TH	1st	Defining Definition of simple machine and its types.
	2nd	Explaining simple & compound lifting machine.
	3rd	Describing Simple lifting machine, load, effort, mechanical advantage,
	4th	Identify applications and advantages
13TH	1st	Stating law of machine
	2nd	Describing Ideal machine, friction in machine
	3rd	Defining maximum Mechanical advantage and efficiency
	4th	Defining reversible and non-reversible machines, conditions for reversibility
14TH	1st	Numerical solving on law of machine.
	2nd	Numerical solving on law of machine.
	3rd	Numerical solving to check the reversibility of machine.
	4th	Velocity ratios of Simple axle and wheel
15	1st	Expalin Geared pulley block.
	2nd	Numerical solving on lgeard pully block
	3rd	Previous year question discussion
	4th	Previous year question discussion & VST

Suggested Learning Resources:

1. Engineering Mechanics by Prof. Bhankhar Bharat Gokaldas (Download from <https://ekumbh.aicte-india.org/dbook.php>)
2. D.S. Bedi, Engineering Mechanics, Khanna Publications, New Delhi (2008)
3. Khurmi, R.S., Applied Mechanics, S. Chand & Co. New Delhi.
4. Bansal R K, A text book of Engineering Mechanics, Laxmi Publications.
5. Ramamrutham, Engineering Mechanics, S. Chand & Co. New Delhi.
6. Dhade, Jamadar & Walawelkar, Fundamental of Applied Mechanics, Pune Vidhyarthi Gruh.
7. Ram, H. D.; Chauhan, A. K., Foundations and Applications of Applied Mechanics, Cambridge University Press.
8. Meriam, J. L., Kraige, L.G., Engineering Mechanics- Statics, Vol. I, Wiley Publication, New Delhi.

Jayadeb Dash.
signature of faculty