GOVERNMENT POLYTECHNIC, PURI
DEPARTMENT OF MECHANICAL ENGINEERING

Discipline:- MECHANICAL ENGG. ENGG.	Semester:- 1ST	Name of Teaching Faculty:- SAURAV RANJAN PRADHAN, LECTURER IN MECHANICAL ENGG.
SUB:- ENGINEERING MECHANICS	No of Days /per week class allotted:-04	Semester From Date:-25.10.21 To Date:-31.01.22 No of Weeks-15
PRE-REQUISITE	Basic knowledge about Mathematics, Physics.	
COURSE OUTCOMES	CO1:- Compute the force, moment & their application through solving of simple problems on coplanar forces. CO2:- Understand the concept of equilibrium of rigid bodies CO3:-Know the existence of friction & its applications through solution of problems on above CO4:- Locate the C.G. & find M.I. of different geometrical figures CO5:- Know the application of simple lifting machines. CO6:-Understand the principles of dynamics.	

WEEK	CLASS DAY	THEORY/PRACTICAL TOPICS	DELIVERY METHOD
1ST	1ST	Fundamentals. Definitions of Mechanics, Statics, Dynamics, Rigid Bodies	Whiteboard
	2ND	Force System. Definition, Classification of force system according to plane & line of action.	Whiteboard
	3RD	Characteristics of Force & effect of Force. Principles of Transmissibility & Principles of Superposition. Action & Reaction Forces & concept of Free Body Diagram.	Whiteboard
	4TH	Resolution of a Force. Definition, Method of Resolution, Types of Component forces, Perpendicular components & non-perpendicular components.	Whiteboard
2ND	1ST	Composition of Forces. Definition, Resultant Force, Method of composition of forces	Whiteboard
	2ND	Analytical Method such as Law of Parallelogram of forces, Problem solving	PPT
	3RD	Method of resolution, Problem solving	Whiteboard
	4TH	Problem solving	
3RD	1ST	Graphical Method. Introduction, Space diagram, Vector diagram, Problem solving Polygon law of forces.	Whiteboard
	2ND	Resultant of concurrent, non-concurrent & parallel force system by Analytical & Graphical Method.	Whiteboard

	3RD	Moment of Force. Definition, Geometrical meaning of moment of a force, measurement of moment of a force & its S.I units.	Whiteboard
	4TH	Classification of moments according to direction of rotation, sign convention, Problem solving	Whiteboard
4TH	1ST	Law of moments, Varignon's Theorem	Whiteboard
	2ND	Couple – Definition, S.I. units, measurement of couple	Whiteboard
	3RD	properties of couple, simple problems on Force systems	Whiteboard
	4TH	**REVISION CH-1/ QUIZ & ASSIGNMENT-1**	Lecture notes
5TH	1ST	Introduction to Equilibrium, Definition, condition of equilibrium & Free Body Diagram.	Whiteboard
	2ND	Analytical & Graphical conditions of equilibrium for concurrent, non-concurrent	Whiteboard
	3RD	Lami's Theorem – Statement, Application for solving various engineering problems.	PPT
	4TH	Problem solving	Whiteboard
6TH	1ST	**REVISION CH-2/ QUIZ & ASSIGNMENT-2**	Lecture notes
	2ND	Definition of friction& Frictional forces, Define Limiting frictional force & Coefficient of Friction, Define Angle of Friction & Repose	Whiteboard
	3RD	Laws of Friction, Advantages & Disadvantages of Friction.	Whiteboard
	4TH	Friction problem	Whiteboard
7TH	1ST	Friction problem	Whiteboard
	2ND	Friction problem	Whiteboard
	3RD	Equilibrium of bodies on level plane – Force applied on horizontal plane	PPT
	4TH	Problem solving of Force applied on horizontal plane	PPT
8TH	1ST	Equilibrium of bodies on level plane – Force applied on inclined plane	Whiteboard
	2ND	Problem solving of Force applied on inclined plane	Whiteboard
	3RD	Problems solving on Ladder friction	Whiteboard
	4TH	Problems solving on wedge friction	Whiteboard
9TH	1ST	**REVISION CH-3/ QUIZ & ASSIGNMENT-3**	Lecture notes
	2ND	Introduction to centroid, centroid of geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles	Whiteboard

	3RD	centroid of composite figures, problems on centroid	Whiteboard
	4TH	Problems on centroid	Whiteboard
10TH	1ST	Moment of Inertia – Definition, Parallel axis theorem	Whiteboard
	2ND	Perpendicular axis Theorems	Whiteboard
	3RD	M.I. of plane lamina & different engineering sections.	Whiteboard
	4TH	Problems on M.I	Whiteboard
11TH	1ST	Problems on M.I	Whiteboard
	2ND	**REVISION CH-4/ QUIZ & ASSIGNMENT-4**	Lecture notes
	3RD	Definition of simple machine, velocity ratio of simple and compound gear train	Whiteboard
	4TH	Explain simple & compound lifting machine	Whiteboard
12TH	1ST	Define M.A, V.R.& Efficiency and State the relation between them, Problem solving	Whiteboard
	2ND	State Law of Machine, Reversibility of Machine, Self-Locking Machine, Problems solving	Whiteboard
	3RD	Study of simple machines – Simple axle & wheel, Problems solving on simple axle & wheel	PPT
	4TH	Single purchase crab winch, Problem solving on Single purchase crab winch	Whiteboard
13TH	1ST	Double purchase crab winch, Problems solving on double purchase crab winch	Whiteboard
	2ND	Discussion of Worm & Worm Wheel, Problems solving on Worm& Worm Wheel	Whiteboard
	3RD	Screw Jack	Whiteboard
	4TH	Problems solving on screw jack	Whiteboard
14TH	1ST	Types of hoisting machine-like derricks etc. Their use and working principle	Whiteboard
	2ND	**REVISION CH-5/ QUIZ & ASSIGNMENT-5**	Lecture notes
	3RD	Kinematics & Kinetics, Principles of Dynamics, Newton's Laws of Motion	Whiteboard
	4TH	Motion of Particle acted upon by a constant force, Equations of motion, Solving problems	PPT
15TH	1ST	De-Alembert's Principle, Work, Power, Energy & its Engineering Applications, Solving problems	Whiteboard
	2ND	Kinetic & Potential energy & its application, Momentum & impulse, conservation of energy & linear momentum, Solving problems	Whiteboard

	3RD	collision of elastic bodies, and Coefficient of Restitution, Solving problems	Whiteboard
	4TH	**REVISION CH-6/ QUIZ & ASSIGNMENT-6**	Lecture notes

LEARNING RESOURCES-

01:- Engineering Mechanics – by A.R. Basu (TMH Publication Delhi)
02:- Engineering Machines – Basudev Bhattacharya (Oxford University Press).
03:- Text Book of Engineering Mechanics – R.S Khurmi (S. Chand).
04:- Applied Mechanics & Strength of Material – By I.B. Prasad.
05:- Engineering Mechanics – By Timosheenko, Young & Rao.
06:- Engineering Mechanics – Beer & Johnson (TMH Publication).

WEBSITE RESOURCES-

01:- www.youtube.com

25/10/21
Sign of Faculty concerned

25/10/21
Sign of HOD i/c

PRINCIPAL
Govt. Polytechnic, Puri