LESSON PLAN

Academic Session: January-May2024

Program Name	Civil Engg.
Subject Name	Engineering Mechanics
Subject Code	ES 106
Semester	2nd
Subject Co-ordinator name	Vivek Sharma

Evaluation Scheme

Sr. No.	Category Of Course	Code No.	Course Title	Hours/Week			Total Hours/Week	Credits	Evaluation Scheme						
									Internal		External				
				L	P	DCS			Th	Pr	Th.	Hrs.	Pr	Hrs	Total
1	Engineering Science	ES 106	Engineering Mechanics (Th)	3	0	1	4	3	40		60	3			
		ES 112	Engineering Mechanics (Lab)	0	2	0	2	1	0	40	0	0	60	3	100
Reference Books				1) Khurmi, R.S., Applied Mechanics, S.Chand & Co. New Delhi											
				2) Applied Mechanics by Birinder Singh Kaption Publishers Ludhiana											
				3) A text book of Engineering Mechanics by RK Bansal, Laxmi Publications.											

Courses Outcomes (Cos)

CO-1	To obtain resultant of various forces.
CO-2	To calculate support reactions through conditions of equilibrium for various structures.
CO-3	To understand role of friction in equilibrium problems
CO-4	To know fundamental laws of machines and their applications to various engineering problems.

Teaching Plan

Unit No.	Name of Topic	Proposed Date	Actual Date	Signature	Remarks
1	Significance and relevance of Mechanics	29/01/24			
	Applied mechanics, Statics, Dynamics. Space, time	30/01/24			
	mass, particle, flexible body and rigid body	01/02/24			
	Scalar and vector quantity, Units of measurement (SI units)	02/02/24			
	Fundamental units and derived units.	05/02/24			
	Force – unit, representation as a vector	06/02/24			
	and by Bow's notation	08/02/24			
	Characteristics and effects of a force,	09/02/24			
	Principle of transmissibility of force,	12/02/24			
	Force system and its classification. Resolution of a force - Orthogonal components of a force	13/02/24			

		Moment of a force, Varignon's Theorem.	15/02/24			
		Composition of forces – Resultant, analytical method for determination of resultant for concur- rent,	16/02/24			
		Non-concurrent and parallel co-planar force systems –	19/02/24			
		Law of triangle, parallelogram	20/02/24			
		Polygon of forces.	22/02/24			
	2	Equilibrium and Equilibrant, Free body and Free body diagram,	23/02/24			
		Analytical and graphical methods of analyzing equilibrium.	26/02/24			
		Lami's Theorem – statement and explanation,	27/02/24			
		Application for various engineering problems.	29/02/24			
		Types of beam, supports (simple, hinged, roller and fixed)	01/03/24			
		and loads acting on beam (vertical point load, uniformly distributed load),	04/03/24			
		Beam reaction for cantilever,	05/03/24			
		simply supported beam with or without overhang-	07/03/24			
		subjected to combination of Point load and uniformly distributed load	11/03/24 12/03/24			
		Beam reaction graphically for simply supported beam subjected to vertical point loads only.	14/03/24 15/03/24			
	3	Friction and its relevance in engineering,	18/03/24			
		types and laws of friction,	19/03/24			
		limiting equilibrium	21/03/24			
		Limiting friction, co-efficient of friction,	22/03/24			
		angle of friction, angle of repose,	26/03/24			
		Relation between co-efficient of friction	28/03/24			
		Angle of friction.	01/04/24			
		Equilibrium of bodies on level surface subjected to force parallel	02/04/24 04/04/24			
		and inclined to plane.	05/04/24			
		Equilibrium of bodies on inclined plane subjected to force parallel to the plane only.	08/04/24			
	4	Centroid of geometrical plane figures (square, rectangle, triangle	09/04/24 12/04/24			
		circle, semi-circle, quarter circle).	16/04/24			
		Centroid of composite figures composed of not more than two geometrical figures	18/04/24 19/04/24			
		Centre of Gravity of simple solids (Cube, cuboid,	22/04/24			
		cone, cylinder, sphere, hemisphere)	23/04/24			
		Centre of Gravity of composite solids composed of not more than two simple solids.	25/04/24 26/04/24			
	5	Simple lifting machine, load,	29/04/24			
		effort, mechanical advantage	30/04/24			
		Applications and advantages.	02/05/24			
		Velocity ratio, efficiency of machines	03/05/24			
		Law of machine. Ideal machine	06/05/24			
		friction in machine	07/05/24			

maximum Mechanical advantage and efficiency,	09/05/24 13/05/24			
reversible and non-reversible machines,	14/05/24			
Conditions for reversibility.	16/05/24			
Velocity ratios of Simple axle and wheel	17/05/24			
Differential axle and wheel	20/05/24 21/05/24			
Worm and worm wheel ,Simple screw jack.	24/05/24			

Assignments

Assignment No.	Contents of syllabus covered	Proposed Date	Actual Date	Signature	Remarks
A-1	Unit-(1-2)	07/03/24			
A-2	Unit-(3-5)	09/05/24			

House Test/Class Test

Name of Test	Contents of syllabus Covered	Proposed Date	Actual Date	Signature	Remarks
Class Test-1	Unit(I-II)	As per HPTSB Academic Calendar			
Class Test-2	Unit (III-V)				
House Test	Unit(1- V)				

Lab Plan

Sr.No.	Name of Practical	Proposed Date G1	Proposed Date G2	Actual Date G1	Actual Date G2	Remarks
1)	To study various equipments related to Engineering Mechanics.	31/01/24 07/02/24	30/01/24 06/02/24			
2)	To find the M.A., V.R., Efficiency and law of machine for Differential Axle and Wheel.	14/02/24	13/02/24			
3)	To find the M.A., V.R., Efficiency and law of machine for Simple Screw Jack.	21/02/24	20/02/24 27/02/24			
4)	Derive Law of machine using Worm and worm wheel	28/02/24	05/03/24			
5)	Determine resultant of concurrent force system applying Law of Polygon of forces using force table	06/03/24 13/03/24	12/03/24 19/03/24			
6)	Determine resultant of concurrent force system graphically.	20/03/24	26/03/24 02/04/24			
7)	Determine resultant of Parallel force system graphically.	27/03/24	09/04/24			
8)	Verify Lami's theorem	03/04/24	16/04/24			
9)	Study forces in various members of Jib crane.	10/04/24	23/04/24			
10)	Determine support reactions	24/04/24	30/04/24			

	for simply supported beam.	01/05/24				
11)	Obtain support reactions of beam using graphical method.	08/05/24	07/05/24			
12)	Determine coefficient of friction for motion on horizontal and inclined plane.	15/05/24	14/05/24			
13)	Determine centroid of geometrical plane figure.	22/05/24	21/05/24			

(Signature of Teacher)

(Signature of HOD)

Approved

Principal

Govt. Polytechnic for Women Rehan

Distt-Kangra (H.P)