Department of Civil Engg.
Govt. Polytechnic for women Rehan
Distt. - Kangra (H.P)

Govt. Polytechnic for Women at Rehan
Dairy No. 2056
Date 11/8/24
Distt. Kangra (H.P)

LESSON PLAN

Academic Session: Aug-Dec 2024

Program Name	Civil Engg.
Subject Name	Mechanics of Materials
Subject Code	CEPC205(Th) & CEPC217(Pr)
Semester	3rd
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	BS			Th	Pr	Th.	Hrs.	Pr.	Hrs	Total
1	Mechanics of Materials	CEPC 205	Mechanics of Materials (Th)	2	0	2	4	2	40		60	3			
		CEPC 217	Mechanics of materials (Lab)	0	2	0	2	1	0	40	0	0	60	3	100
Reference Books				1) Structure Mechanics by Birinder Singh Kaption Publishers Ludhiana											
				2) Khurmi, R.S., Strength of Materials, S Chand and Co. Ltd. New Delhi.											
				3) Bansal R K, Strength of Materials, Laxmi Publications.											

Courses Outcomes (Cos)

CO-1	To learn properties of area and structural material properties.
CO-2	To understand the concept of stress and strain.
CO-3	To calculate shear force, bending moment for different shapes of structural elements and corresponding stresses.
CO-4	To understand the concept of buckling loads for short and long columns.

Teaching Plan

Unit No.	Name of Topic	Proposed Date	Actual Date	Signature	Remarks
1	Moment of inertia (M.I.): Definition, M.I. of plane lamina	02/08/24 03/08/24			
	Radius of gyration, section modulus,	05/08/24			
	Parallel and Perpendicular axes theorems (without derivations),	09/08/24 09/08/24			
	M.I. of rectangle, square, circle	12/08/24			
	semi-circle, quarter circle and triangle section (without derivations).	14/08/24			
	M.I. of symmetrical and unsymmetrical I-section	16/08/24			
	Channel section, T-section, Angle section,	17/08/24			

	Hollow sections about centroidal axes.	19/08/24			
	Polar Moment of Inertia of solid circular sections.	21/08/24			
2	Definition of rigid, elastic and plastic bodies,	23/08/24			
	Definition of stress, strain, elasticity, Hook's law,	24/08/24			
	Elastic limit, Modulus of elasticity. Type of Stresses-Normal,	28/08/24			
	Direct, Bending and Shear and nature of stresses i.e., Tensile and Compressive stresses.	30/08/24			
	Standard stress strain curve for tor steel bar under tension	31/08/24			
	Yield stress, Proof stress, Ultimate stress,	02/09/24			
	Strain at various critical points, Percentage elongation and Factor of safety	0409/24			
	Deformation of body due to axial force, forces applied at intermediate sections	06/09/24			
	Maximum and minimum stress induced, Composite section under axial loading	07/09/24			
	Concept of temperature stresses and strain, Stress and strain developed due to temperature	09/09/24			
	variation in homogeneous simple bar (no composite section) Longitudinal and lateral strain,	11/09/24			
	Modulus of Rigidity, Poisson's ratio, volumetric strain, change in volume,	13/09/24			
	Bulk modulus (Introduction only). Relation between modulus of elasticity,	16/09/24			
	Modulus of rigidity and bulk modulus (without derivation).	18/09/24			
3	Types of supports, beams, and loads.	20/09/24			
	Concept and definition of shear force and bending moment,	21/09/24			
	Relation between load, shear force and bending moment (without derivation).	23/09/24			
	Shear force and bending moment diagram for cantilever	25/09/24			
	and simply supported beams subjected to point loads	27/09/24			
	Uniformly distributed loads (combination of any two types of loading), point of contra flexure.	28/09/24			
4	Concept and theory of pure bending	30/09/24			
	assumptions, flexural equation (without derivation)	04/10/24			
	bending stresses and their nature	05/10/24			
	bending stress distribution diagram	07/10/24			
	Concept of moment of resistance and simple	09/10/24			
	numerical problems using flexural equation	11/10/24			
	Shear stress equation (without derivation)	14/10/24			
	relation between maximum and average shear stress for rectangular	16/10/24			
	and circular section, shear stress distribution	18/10/24			

	diagram				
	Shear stress distribution for square	19/10/24			
	rectangular, circle	21/10/24			
	hollow, angle sections	23/10/24			
	channel section	25/10/24			
	I-section	26/10/24			
	T section	28/10/24			
	Simple numerical problems based on shear equation.	30/10/24 01/11/24 02/11/24			
5	Concept of compression member	04/11/24			
	short and long column	06/11/24			
	Effective length, Radius of gyration	08/11/24			
	Slenderness ratio	11/11/24			
	Types of end condition for columns	13/11/24			
	Buckling of axially loaded columns.	16/11/24			
	Euler's theory, assumptions	18/11/24 20/11/24			
	made in Euler's theory and its limitations	22/11/24			
	Application of Euler's equation to calculate buckling load.	23/11/24			
	Rankine's formula	25/11/24			
	and its application to calculate crippling load	27/11/24			
	Concept of working load	29/11/24			
	safe load	30/11/24			
	design load and factor of safety	02/12/24			

Assignments

Assignment No.	Contents of syllabus covered	Proposed Date	Actual Date	Signature	Remarks
A-1	Unit-(1-2)	22/09/2024			
A-2	Unit-(3-5)	30/11/2024			

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 Calender			
Class Test-2	Unit (III-V)				
House Test	Unit(1- V)				

Lab Plan

Sr. No.	Name of Practical	Proposed Date		Actual Date		Remarks
		G1	G2	G1	G2	
1)	Study and understand the use and components of Universal Testing Machine (UTM)	06/08/24 13/08/24	07/08/24 14/08/24			

2)	Perform Tension test on mild steel as per IS:432(1).	20/08/24 27/08/24	21/08/24 28/08/24			
3)	Perform tension test on Tor steel as per IS:1608, IS:1139.	03/09/24 10/09/24	04/09/24 11/09/24			
4)	Determine Water Absorption on bricks per IS:3495 (part II), IS:1077 or tile IS:1237	17/09/24	18/09/24 25/09/24			
5)	Determine Compressive strength of dry and wet bricks as per IS:3495(part I), IS:1077	24/09/24 01/10/24	09/10/24 16/10/24			
6)	Conduct Abrasion Test on flooring tiles (anyone) e.g., Mosaic tiles, Ceramic Tiles as per IS: 13630 (part7), Cement Tile as per IS: 1237.	08/10/24 15/10/24	2310/24 30/10/24			
7)	Perform Single Shear and double shear test on any two metals e.g., Mild steel/ brass/aluminum/copper / cast iron etc as per IS:5242.	22/10/24 29/10/24	06/11/24			
8)	Plot Shear force and Bending Moment diagrams for simply supported beams.	05/11/24 12/11/24	13/11/24			
9)	Conduct Flexural test on timber beam on rectangular section in both orientations as per IS:1708, IS:2408	19/11/24	20/11/24			
10)	Conduct Flexure test on floor tiles IS:1237, IS:13630 or roofing tiles as per IS:654, IS:2690.	26/11/24	27/11/24			

(Signature of Teacher)

(Signature of HOD)

Approved

Principal

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